



FRIDAY, NOVEMBER 12.

The American Society of Mechanical Engineers and its Work.

[Passages from the inaugural address of Prof. R. H. Thurston, the first President, delivered at the annual meeting in New York, Nov. 4, 1880.]

This Society has been founded by members of the profession of engineering who felt that there has long existed a necessity for an organization composed of men directly or indirectly connected with the work of mechanical construction. There had previously existed no society in which the work of the mechanical—or, as one of our honored vice-presidents had proposed to call him, the dynamical—engineer could receive special consideration.

Hundreds of engineers are engaged throughout this country in the work of designing and constructing machinery who have felt the need of opportunities to meet socially to compare their own ideas with those of their professional brethren, and who have desired to place before others in the business their plans, their discoveries, or the results of their researches.

Several of these gentlemen finally determined to make the attempt to effect an organization which should be composed of mechanical engineers, of those who are interested in mechanical matters and of others engaged in kindred pursuits.

OBJECTS OF THE SOCIETY.

The objects to be attained by this Society, if the wishes and expectations of its founders are carried out, are the promotion of "the arts and sciences connected with engineering and mechanical construction," by the establishment of regular meetings to be attended by members of the engineering profession, and by those whose interests and pursuits lead them to associate themselves with us, at which meetings professional papers are to be discussed, and such other means of mutual instruction and entertainment are to be adapted as may be deemed best fitted to secure these objects.

It is further proposed to publish and to circulate among the members of the Society such papers as shall be considered of sufficient value to justify publication.

It is hoped that, ultimately, this Society may become useful to its members by gleaming from among the great mass of technical literature, which is every day becoming more extensive and more cumbersome both at home and abroad, such papers, wherever published, as shall have real value to the mechanical engineer, and presenting them, either in full or by abstracts, to its own members, as has been done lately in a very satisfactory way by the British Institution of Civil Engineers.

The headquarters of the Society should be to all its members an attractive resort socially, and occasional conversations will probably be found as useful, as they undoubtedly will be a pleasant, means of securing acquaintanceship and frequent intercourse among members.

The Society will have much work to do as a union of citizens having important interests confided to them, and its province will lie no less in the field of social economy than in that which has reference only to the individual interests of its members.

Much is being done by the general government in the development of the material resources of our country, and more remains to be done, in all of which work our members, individually and collectively, have an especial interest.

The new organization of the geological survey is such, in form and in the character of its administration, that we hope to see the work of determining the value of our mineral resources done with maximum rapidity and efficiency, and we are all interested in that work, especially where it touches the development of the deposits of coal and of the "useful metals," the ores of which underlie so many millions of acres of our widely extended domain.

The work of determining the value, comparative and absolute, of the metals, and of alloys of the metals, which are produced from those ores, was entrusted, a few years since, to a commission appointed by the government, and the work was actually commenced; but the indifference of many who should have used their powerful influence to sustain that commission, and the absence of concerted effort when action was most needed, led to the abandonment of that great work. This Society may aid other professional societies in the effort which they intend making to secure the resumption of labor in that direction, and its aid cannot fail to be very effective.

Business men in this country have hitherto been able to influence legislation in relation to matters directly bearing upon the business interests of the nation far too little, and we have often, and sometimes long, suffered from the effects of legal enactments made by ignorant legislators, influenced by personal motives and the selfish advice of scheming lobbyists.

This will be corrected when business men have learned to organize and to act concertedly whenever the business of the country is liable to be affected by legislation. It is their right to be heard fully and patiently, and it is their duty to take such action as will secure for them due consideration.

This Society will find an excellent field of operations here and in the encouragement of all the useful arts, in the intelligent direction of the education of the people, and in the enlightenment of our national legislators in regard to the needs, the wishes and the legal and moral rights of the industrial classes in our country.

It may even be hoped that the time may come when we shall not again see the memorials of the leading manufacturers' associations, of the principal professional societies, of the faculties of our best-known technical schools and of the great colleges of the country, and the solicitation of committees and private individuals in great numbers, asking the appropriation of twenty thousand dollars for the purpose of determining the value of our materials of construction more perfectly than private individuals could do it, all passed by without notice, while the same committee, refusing this small amount for a national object, granted a lobbyist's application for some thousands of dollars to purchase a useless mass of cast-iron to deface a public park.

The organized and combined action of the members of this Society will be able to secure the investigation of many important problems, such as are familiar to every one in the profession as urgently pressing for solution.

The class of men from whose ranks the membership of this society is principally drawn direct the labors of nearly three millions of prosperous working people in a third of a million mills and other manufacturing, are responsible for the preservation and profitable utilization of 2,500 millions of dollars' worth of capital, direct the payment of more than 1,000 millions of dollars in annual wages, the consumption of 3,000 millions of dollars' worth of raw ma-

terials and the output of 5,000 million of dollars worth of manufactured products. Fifty thousand steam engines, and more than an equal number of water-wheels, at their command, turn the machinery of these hundreds of thousands of workshops that everywhere dot our land, giving quietly and docilely the strength of three millions of horses, night or day, or all night and all day, whenever the demand comes for their wonderful power.

This society, when it shall have become properly representative of such a class, may well claim position and consideration.

METHODS OF WORK.

And the question arises, "How are we to work, and what is wanted of us? what is the best method of advancing this department of knowledge? what method is most truly philosophical and most productive of results?"

The question is soon answered. There is, as I have already elsewhere taken occasion to show, but one philosophic method of advancement of science.*

We are to decide upon methods of working and upon plans in detail, and we are to initiate these schemes with promptness and intelligence.

We must seek to acquire a knowledge of facts, to understand natural laws, and to ascertain their positions and their mutual relations in nature's code. We are to endeavor to hasten the approach of that great day when we shall have acquired a complete and symmetrical system of mechanical and scientific philosophy.

Our methods must be simple; they must be comprehensive, and they must be productive of maximum results in giving our industrial system such form and such distribution of material that its work shall be done with highest efficiency and economy.

The first step in any such work is the careful collection of facts and the patient study of all phenomena involved, and the registry of such facts and phenomena in the most accurate possible manner, and so systematically and completely that they shall be readily and conveniently available, and in such shape that their values and their mutual relations shall be most easily detected and quantitatively measured.

In this work we need the aid of careful and precisely-directed observation, and if we can secure the assistance of men whose powers are exceptional, and whose skill has been perfected by training and experience, and who are prepared by habits of study to direct such effort, and to supply the demand for the application of knowledge already acquired, we shall find our work immensely facilitated.

We have, therefore, the task before us of determining what are the directions in which investigation is most needed, and to decide what path research shall take. We are to find, among associates and colleagues, men well fitted to undertake such work, and encourage them to take up the labor of investigation; we must find for these self-sacrificing students of science, pure and applied, means sufficient to enable them to work efficiently and productively; we must learn to narrow the gulf which has separated men of business from men engaged in study, in experiment and in diffusing useful knowledge; we have to exhibit the fact that a community of interests exists between these two classes, and that it is as impossible for industry to prosper thoroughly without the aid of the investigator, the philosopher and the inventor, whether of a machine or a process, as it is for the researches progressing on all sides in applied science to go on without aid from those whose business it is to acquire tangible wealth. He who gains wealth is invariably largely, even though usually indirectly, indebted for his prosperity to him who, without thought of pecuniary gain, is unselfishly devoting life and health to the attainment of scientific knowledge.

Science and the most perfect art can only flourish when assisted by wealth, and wealth can only come with least sacrifice to a country in which the true spirit of inquiry is awake and stimulating investigation. The more nearly men of the world and men of science are brought together, the more prosperous are all classes, and the happier and more contented are the people. We need all—observers, discoverers and inventors; explorers of all fields of research; students of Nature's facts, and codifiers of Nature's laws and teachers of all applied sciences, as well as workers in field, in workshop and in office. And we must have men who seek that highest honor which comes of the endowment of science—philanthropists, like Stevens, and Rose, and Case, and a hundred others who are not, like these, members of our own profession, whose gifts have been the most splendid of charities and the most beneficent of all great work.

Those of you who have been familiar with the design and construction of steam engines during the past twenty or thirty years, and those of you who have been for a generation past accustomed to handle this miracle of art, will remember, as I remember well, how we learned at a very early period in our experience, certain cardinal points of practice were very strongly impressed upon us. We soon learned by experience that efficiency was gained only as we learned to handle higher steam with properly adjusted expansion, to work our engines up to higher piston speeds, to cushion heavily when we had large clearance, to reduce that clearance to a minimum, to adjust the size of our engine to its work, and to determine the point of cut-off, under proper conditions otherwise, by the governor. We learned that the now well-known "American automatic cut-off engine," with its high steam and moderately large expansion, as exemplified by the "Corliss engine," which is now built all over the world, was the representative of best general practice.

But we were not satisfied. Twenty years ago we began to understand that we had yet to perfect the philosophy of the steam engine, and that it was still apparently far from perfect efficiency. We then discovered that while our best engines were consuming from 25 to 30 lbs. of dry steam per horse-power per hour, the mechanical equivalent of the heat supplied to the steam in the boiler was sufficient to give about a horse power per each two lbs. of high-pressure steam per hour, and hence that we were utilizing but one-tenth or one-fifteenth of the heat we were paying for when we settled our coal bills.

Next we found that, owing to the fact that we cannot practically expand down to a pressure lower than that due approximately to the temperature of surrounding bodies, that we must therefore discharge heat unutilized, that the larger part of this waste is unavoidable, and that an engine, perfect mechanically and working within the maximum usually practicable limits, must waste three-fourths and can return useful effect from but one-fourth of the heat supplied, thus placing the practical limit under known conditions at about eight or ten pounds of steam per hour and per horse power.

And here we stand to-day with the steam-engine,

*Vice-President's address before Section II of the American Association for Advancement of Science: "On the Character of Physical Science and on the Philosophic Method of the Advancement of Science," at St. Louis, 1878; Trans. Am. Assn., Vol. XXVII.

†Report on Machinery and Manufactures at Vienna, 1873, by R. H. Thurston, etc., etc.; Wash., 1875.

‡History of the Growth of the Steam Engine. International Series; N. Y., 1878, p. 473.

mechanically almost perfect, yet with a theoretical economy of about eight or ten pounds of steam per horse power per hour while consuming actually, in the best examples, about fifteen, i. e., with an efficiency of 60 or 70 per cent.

In hot-air engines we are not making much more rapid progress, and our field of promise seems to be still in the improvement of the steam-engine.

We are slowly learning other facts. We know that the great obstacle in the way of attaining nearly theoretical efficiency is the transfer of heat from the steam to the exhaust side by initial condensation and re-evaporation; we are discovering that high speed and steam jacketing tend to lose their efficiency at extremely high pressure with wide ranges of expansion; that it seems possible to reach a point in steam-jacketed cylinders at which lower speed may tend to secure efficient working of the steam; that with well jacketed cylinders we may get good performance, as we to-day judge it, with slow pistons; that we have better work claimed to-day for single than for "compound" engines by 10 or 15 per cent.,* the minimum yet reached under fair conditions for economy, being stated to be by experiment as 1.54 is to 1.75, while, assuming the very best conditions for each, it seems certain that both types should give about equally good results.

Here is where we stand to-day, and it is from this point that we are to work forward. We need to collect more facts by means of carefully-devised experiments like those of Hirn and Hallauer abroad, and of Emery, and of the Navy Department at home; we need careful and systematic study of the results, and finally the determination of the laws of steam-engine efficiency as affected by steam pressure and temperature, rates of expansion and compression, character of steam jackets, rate of piston speed, and every other circumstance influencing economy.

THE ETHICS OF CO-OPERATION.

This, and such as this, is work for some of us, and such work is to be done in every one of the many branches of industry which are here represented. And this, too, is a kind of work in which all can take part, fully confident that the good work shall benefit all and shall injure no one member of the human race.

That great member of our profession, that engineer who has become the greatest philosopher of our age, or indeed, I think, of any age—Herbert Spencer—in his last and culminating work, the "Principles of Morality," shows us, in his "Data of Ethics,"† how the natural evolution of the noblest conduct, as traced by the scientific mind of the moralist, accords perfectly with that dictated by the noblest minds and best men of all times, as well as by the truest Christian philosophers.

The great moralist shows us that naturally right conduct—scientifically correct conduct—toward which we are constantly progressing, as civilization and intelligence advance, as well as righteous conduct, such as the best of men admire and teach, leads to the care of self, of family, of friends, of fellow-citizens and of mankind, by the individual and by society, in such a manner as shall, at the same time, most perfectly protect the interests of each individual, while to the least possible extent injuring his neighbor in the process; and he further shows that perfect conduct, whether considered scientifically, or morally and religiously adjudged, will be attained when we shall have learned to fully protect and preserve self and family, and to individually attain length of life, perfect health and unalloyed happiness while yet, in the same degree of completeness, promoting the same end as sought by each of our neighbors and by society at large.

In other words, when we shall have become sufficiently intelligent, and sufficiently good, to exhibit "perfect conduct" in all our relations, we shall find that the promotion of mutual welfare is, in the highest degree, consistent with—and that it is only consistent with—the highest, the most perfect system of mutual co-operation and mutual aid in all the truest and highest aims of life. Then, this point reached, life will really become "worth living," and mankind will occupy a place very, very "little lower than the angels."

This, then, is the fundamental rule of action and these are the principles which we may hope, will always guide the American Society of Mechanical Engineers in every effort to aid the profession and to benefit the world.

First Annual Meeting of the American Society of Mechanical Engineers.

According to announcement, this meeting was held in the Union League Club Theatre, on Thursday and Friday of last week. Professor R. H. Thurston, President of the society, presided. About one hundred members were present. After the transaction of some routine business, the first paper was read by Professor Sweet. By a special resolution adopted at the meeting at which the Society was organized, he was invited to read the first paper. This honor was conferred on him because of the interest he has taken in the organization of the Society. His paper was a presentation of the merits of a class of steam engines which he has designed, and is now manufacturing. Mr. Coleman Sellers followed Professor Sweet with a paper opposing the adoption of the metric system. The objections to it were very vigorously stated, and elicited a warm discussion. This paper, or an abridgment of it, and of the discussion, we expect to publish in the Railroad Gazette. After it was discussed, the following resolution was proposed by Mr. Henry R. Worthington:

"Resolved, That this Society deprecates any legislation tending to make the introduction of the metric system obligatory into our industrial establishments."

"Also resolved, That the Secretary be instructed to communicate the sentiments of this resolution to any one concerned in procuring such legislation, and also to send a copy to the society in Cleveland called the Anti-Metric Society."

After discussion it was voted to refer this resolution for a letter ballot.

The following committees were then appointed: on Rooms and Conversation, Messrs. Eckley B. Cox, J. C. Hoadley, J. C. Bayles, A. Faber du Faur, and Prof. Frederick H. Hutton; on Regular Meetings, Messrs. Coleman Sellers, Washington Jones, Wm. Lee Church, M. N. Forney and C. E. Emery.

The President also announced that the Council had appointed Mr. T. Whiteside Rae Secretary to the Society. Mr. Rae has been for some years engineer in the United States Navy, instructor in the Naval Academy at Annapolis, and more recently engaged in laying submarine cables. His selection for the position is a very fortunate one for the Society, as its future success depends very largely on the manner in which the duties of that office are performed. His address will be 239 Broadway, New York.

After the opening of the afternoon session on Thursday

*Abstracts of Papers, No. 1,602; Proc. Brit. Inst. C. E.; Vols. LIII, LIV. It would seem that where slow piston speed is demanded, as usually with pumping engines or where two cylinders are needed, as with marine engines, the "compound" engine is unmistakably best; while where high-speed engines are permitted, as in mills, the single-cylinder may still hold its own in this competition.

†The Data of Ethics. By Herbert Spencer. New York: D. Appleton & Co. 1880, 12mo, pp. 228.

the President delivered, or, rather, caused to be read, the annual address. Unfortunately for the Society, Professor Thurston partly lost his voice a few days before the meeting, and had not sufficiently recovered it to deliver his address, and therefore referred it to Mr. Bayles, editor of the *Iron Age*, to read for him. An abstract of this is published in this number.

A paper on "An Adaptation of Bessemer Plant to the Basic Process" was read by Mr. A. L. Holley. Mr. J. C. Hoadley, of Lawrence, Mass., delivered what might be called an oral paper setting forth a theory for the superior economy of compound engines. His remarks were illustrated by an elaborate series of diagrams, showing graphically the action of the strain in relation to the rotative effect on the crank. It is to be hoped that Mr. Hoadley will write out in full what he said, or its substance, so that his interesting contribution to this much-disputed question may not be lost. Mr. Porter read a short but interesting paper on "The Strength of Machine Tools."

The session of Friday was opened by a discussion of Mr. Hoadley's paper on the compound engine. This was very animated and interesting, and was followed by a few remarks on Mr. Porter's paper. Following this, Mr. C. J. H. Woodbury, of Boston, read extracts from a very long and elaborate paper on "Friction and Lubrication." It consisted largely of tabular and graphical representation of results of experiments which were difficult to comprehend by merely listening to the reading of a portion of a paper which described the methods and purposes of the experiments. It also was discussed with considerable interest.

Prof. S. W. Robinson, of Columbus, Ohio, presented two papers, one on "The Efficiency of the Crank" and another on the "Adjustment of the Cushion in Steam Engines." These papers were too long to be read. They were illustrated by a very elaborate series of diagrams, calculations and formulae which the author tried to explain extemporaneously. Probably not a half-dozen of his audience could follow his explanation of this abstruse subject. On another page, however, there are some comments on the reading of such papers at meetings of this kind. The two subjects, though, were discussed as if those who listened to the elucidation of them understood every algebraic sign and formulae shown to them.

Mr. Jacob Reese, of Pittsburgh, read a paper descriptive of a new furnace of his invention intended for metallurgical purposes. Mr. George R. Stetson, of New Bedford, Mass., one on "Standard Screw Threads," which was also discussed. Mr. Sterling presented an essay on the "Economy of Fuel in Steam Engines." A description, written by Mr. Johnson, was given of a method of replacing a broken crank-pin in a marine engine.

Papers on "Mechanical Correctness," by Charles A. Hague, of Chicago; on "Piston-Rod Packing," by Lewis F. Lyne, of New York, and on the "Mechanical Theory of Heat," by Mr. Wolff, were also read.

Those papers and discussions which will probably interest our readers most will be published in future numbers.

At the close of the meeting Mr. Holley moved that a vote of thanks be returned to Mr. Moore, who, up to the appointment of his successor, has been the acting Secretary.

The resolution was unanimously adopted, and the meeting then adjourned subject to the call of the Council.

The Grand Trunk's Relations with American Roads.

The following extracts from the speech of Sir Henry Tyler, President of the Grand Trunk Railway Company, at the stockholders' meeting in London, Oct. 28, have a special interest to American readers:

Now, the question of rates is a very important one to us, and I am sorry to say that they have not attained to the point which they ought to reach, and which I hope they will reach; but the arbitrators are doing their work in America and making some progress. There is a weakness about all these arrangements, that they depend upon the consent and co-operation of the companies interested. Unfortunately, they are too fond of cutting one another's throats, as we have heard for many years. I think we have set them all a most admirable example. When the Chicago & Grand Trunk was opened to Chicago, instead of cutting rates and trying by that means—more Americano—to get traffic over the line, as everybody prophesied we were going to do, and as they have usually done before in America under like circumstances, we went before the American arbitrators (not arbitrators chosen by ourselves) and placed our case fairly before them, asked them to adjudge what proportion of the traffic out of Chicago we ought to receive. They allotted to us 10 per cent. of the freight and 6 per cent. of the live stock. We did not think that was as much as we ought to receive, but we were content to accept whatever they decided; and I, for my part, am rather glad that they did not give us more, because I believe it would have led to a good deal of bad feeling if the American companies thought that we were getting more than we ought to get; and they might try to injure us, and would be dissatisfied. I think they must all admit that we have got rather less than we ought to get; but we may hope to get more in future. At any rate, it is a fair proportion to begin with before our line is completed—10 per cent. of the enormous traffic which flows out of Chicago. We have been trying to make similar arrangements in pooling from Detroit, but, unfortunately, we have not yet succeeded. It will be obvious on the smallest consideration that the various lines ought to arrange between them a pool at every great diverting point. As you have a pool of traffic divided at Chicago, so when you come to another junction where there are several lines, it ought to be divided again, and so on until the whole of the traffic is pooled wherever there are more than two companies coming into competition with one another in carrying. The difficulty has been, I am sorry to say, with the Great Western. There is a trite saying in America, when people are in difficulties, or meet with obstructions, that "there is a nigger in the fence, or in the wood-pile, somewhere." (Laughter.) Whenever we try to make arrangements with the American companies there is a kindred company in this country that always turns out to be the "nigger in the wood-pile." I do not say this in any ill-natured way, but, unfortunately, the Great Western always turns up. We find no difficulty now in making arrangements with the American companies wherever we meet them; but wherever we meet with the Great Western there always turns out to be some difficulty, and that difficulty is serious now at Detroit, because they will not go into a pool of the traffic there which we desire to do. I have said a great deal about the Great Western in past times, and have done a good deal towards advocating a fusion with that company. I do not advocate that now. Looking at the matter from a Grand Trunk point of view, I do not think we ought now to be in any hurry to fuse. We think now we are in an improving condition, so that we can afford to wait, and we do not, therefore, want to press any fusion at present. But I do wish to press them to another thing, and that is this—that when we come to any junction where we meet, they shall agree to a fair division of traffic between the two companies in an amicable way. We are always prepared to enter into such arrangements, and if

they would only act in the same spirit we should get on very nicely together. This is not a point which I am now mentioning for the first time, for when I met Mr. Childers at Sarnia in 1877, and engaged with him in prolonged negotiations there, that was precisely what I asked him to do—to go with me to the New York Central and the Erie, and try to make a pool of traffic with those large companies in conjunction with the Great Western. They did not see their way to doing so then, and they do not see their way to it yet, but I hope the time will come when they will arrive at a better frame of mind, and when we shall make amicable divisions of traffic conjointly with them and other companies. There is one very satisfactory circumstance which has helped us on to the prosperity we have attained so far, and that is an increase in the west-bound traffic. Formerly we carried about one-fourth west-bound to three-fourths east-bound. In the half-year ending June, 1879, of the total traffic we carried 77 per cent. east-bound and 23 per cent. west-bound, but in the half-year ending June, 1880, we carried 72 per cent. east-bound and 28 per cent. west-bound. It will be obvious to you that the more we can load our cars running West empty with traffic the better for us. I have alluded to the live-stock traffic out of Chicago, of which we have been awarded 6 per cent., and on that subject I am bound to say a few words. We have been in the habit of carrying for some years a large hog traffic from Chicago, which we have done very satisfactorily—to the perfect satisfaction, I believe, of the gentleman who is principally instrumental in sending the traffic. Now, that gentleman came to us not long ago and asked us to make a contract with him for carrying that traffic at a lower rate. That was against the rules of the Joint Executive Committee, and we refused to do it. After pressing us very much that gentleman went to the Erie Company and asked them to make a contract with him, and I am very sorry to say they did so, and that they took away by that means the whole of that traffic from us, thus disobeying the regulations which they were bound to uphold and protect. Not only did they take away the traffic from us, but the result has been that they have lowered the rates of such traffic over that part of the continent. You may smile when I tell you that when the matter came before the Joint Executive Committee, that the contract should be abrogated, other parties were asked to subscribe toward buying off the contract, and they came and asked us to pay a portion of the subscription which might be allotted to us for buying it off. Having taken the traffic away by making lower rates and making a contract which they ought not to have made, they came and asked us to pay for getting rid of it. I could not put it in a better way than in the words of Mr. Fink himself. We were not present at the meeting at which the matter was discussed; but Mr. Fink said at the meeting: "He would state that the Grand Trunk would under no circumstances pay any money as proposed by Mr. Blanchard for the privilege of having this business, for which they received full rates, taken away from them by this contract." The result was a resolution to reduce the rate of live hogs was then passed. I have said enough about the Great Western already, and I hardly like to mention the subject, but I may be permitted to say that the traffic so taken from us is carried by the Erie, the Great Western and Michigan Central, as against us. I do not want to quarrel with the Erie in mentioning these things, but it is only right that I should refer to them. Mr. Jewett called upon me when he was in London, and I stated the circumstances to him, and he promised that if the statement was correct the contract should be got rid of. He has since been out to New York, and I know he has been looking into the subject. He has not yet got rid of the contract, but I do hope that in good faith and amity he will do so—indeed, I have confidence that he will.

I think we may expect from our line to Chicago, and from other connections that we have been making and from the general improvement of Canada, an increase in our traffic; and therefore better things in the future than we have ever yet realized. Before I leave Chicago altogether I ought to tell you a little more of the position of that line. (Hear, hear.) I told you that we have been making repairs upon it, that we have laid nearly half of it with steel rails, and that we are getting rolling stock delivered on it, and are now about to get our entrance into Chicago. That entry has been a species of battle field for some time past. We have been trying to get in there in conjunction with the Chicago & Western Indiana and the Wabash, and we have met with a great deal of obstruction from the Lake Shore, which is under the same control as the New York Central. I do not blame them for obstructing us. I dare say if other people wanted to compete with us we might obstruct them, and I do not mention it by way of blame, but only to tell you what the fact is, that there have been considerable difficulties. The forces marshalled by both parties have been large; there have been injunctions in the courts; there have been engines placed and rails displaced, there have been fires lighted with sleepers and other materials, and even the Mayor of the city and some of the officials, I am sorry to say, have had to be dealt with by the local authorities; and a good many people have got their heads broken by brickbats. But that state of things is now coming to a conclusion. The last injunction is to be heard next week, and you may depend upon it that sooner or later we shall get into the district which is awaiting us in the heart of Chicago. We have had various opportunities afforded to us of going into different stations on different terms. We have at length selected a position which is about the best in the whole city, and which we shall get at what is for such a position a moderate price. We have been told by our friends and rivals that it would cost a million sterling to get into Chicago, or that we should have to pay at least \$25,000 a year for it. Well, the utmost that it will cost us to get station accommodation there is about £3,500 or £14,000 a year. Now the question arises, and I am glad to have the opportunity of offering it for your consideration, whether it would not be better to raise the money which is necessary for the purpose at something like 5 per cent. (which I think we might fairly expect to do in the present state of the market), and so save two or three thousand pounds a year in providing this accommodation.

An Extensive Ticket Forgery.

The *Detroit Post and Tribune*, of Nov. 6, gives the following account of the discovery of an extensive plan to swindle railroads by means of forged tickets, which seems to have been partially successful:

Detective Bishop and Mr. Frank E. Snow, General Passenger Agent of the Canada Southern Railroad, left this city last night for Chicago with the necessary papers to bring back with them two young men, known as Faucet and Tilden, alleged to have been engaged in the business of forging railway tickets and passes. The two men were arrested in Chicago night before last by officers there on a telegram from Superintendent Rogers of this city, who sent full particulars by wire of their habits, appearance and manners.

It appears that the Chicago officers cooperated intelligently and promptly.

The circumstances connected with the arrest and the incidents that led up to it are somewhat unusual, as will be seen further on, in the detection and capture of criminals. A few days ago two men visited the small printing establishment of Charles R. Baker, at No. 303 Woodward avenue, and said that they were in the employ of the Canada Southern Railway Company. They further said that they were getting prices for setting up and printing tickets for the road by Mr. Snow's order, and that the matter was an important one and the order profitable provided the work was satisfactorily done. Their apparent acquaintance with the affairs of the road and the men employed by the company, together with their general knowledge of the railroad business, imposed upon Baker, he declares, and led him to believe that the men were just what they represented themselves to be. The same persons had, however, procured from him a large number of Lake Shore & Michigan Southern single trip tickets, to be used from station to station, nearly a month previous to this last order. Baker declares that there was no inconsistency in their different orders from him, and he had taken the contract for both orders in good faith.

In the order for Canada Southern tickets they stipulated to see the proofs, called when the copy had been set up, and, after reading the slips very carefully, stated that they should have to submit them to Mr. Snow before having him run them off. Subsequently they told him to go ahead after making some changes which they indicated, exhibiting at the same time a telegram purporting to be from the General Agent, and stating what alterations ought to be made. Last Wednesday morning Baker began the work of running them off. His facilities for rapid and complete work of the kind are not very perfect, as he has only a small outfit of type and a Gordon press.

The tickets purported to be coupon tickets from St. Thomas, Ont., to Denver, Col., and represented passages by the Michigan Central, the Chicago, Alton & St. Louis, the Missouri Pacific and the Union Pacific to that city. The signature of General Passenger Agent Snow was a *fac simile* and the general appearance, style of reading, tinting of the paper used (which, it is alleged, was expressly stipulated for by the two forgers) and the type, with a single exception, resembled very closely one of the forms of tickets used by the Canada Southern. The exception referred to was the heavy black letter used in the words "Canada Southern Railway Lines," which headed the tickets. It is probable that a very observant and careful conductor of that line would have detected the forgery, but the intention undoubtedly was not to use them on the Canada Southern road proper, but only as issued by that road for the other roads mentioned. In that case the conductors on these roads would not have perceived the counterfeit character of the ticket, inasmuch as the forms vary a good deal, being different sometimes from different stations. The tickets from St. Thomas to Detroit have no coupon, and this fact goes still further to show that there had been no intention to use these counterfeits east of Detroit.

Charles R. Baker, the printer who did the work, occupies as a job office the rear part of a picture frame and news store kept by his father, John R. Baker. Wednesday afternoon, Mr. H. F. Eberts, the well-known Canada Southern excursion agent, went into the news store to make a purchase, and, while loitering there over some of the periodicals, heard the proprietor conversing with a possible job-printing customer regarding the work done by his son. As an illustration of his skill, the elder gentleman cited the fact that General Passenger Agent Snow, of the Canada Southern Railway, had given a large order to him for railroad tickets. This statement attracted Mr. Eberts' attention, as he at once knew that it was highly improbable that any such order had been given. He entered casually into the conversation and expressed a desire finally to see a sample of the tickets. About 50 of them had been printed at that time, and the elder Mr. Baker promptly procured one and exhibited it with a great degree of pride. His examination convinced Mr. Eberts more firmly that the tickets were spurious, and he immediately repaired to the office of Charles A. Warren, the local passenger and ticket agent for the road, and informed him of his suspicions. They concluded, after a brief consultation, to telegraph for Mr. Snow to come on from Buffalo and to consult Police Superintendent Rogers. This was done, and, upon Mr. Snow's arrival, he and the Superintendent of Police visited the Bakers' establishment and made a careful examination of the tickets. The General Passenger Agent at once pronounced them counterfeits. Young Baker and his father seemed very much affected at the turn matters had taken, and the former then made the statement given above and volunteered all the information in his possession. The general opinion among those connected with the matter seems to be that he had no guilty complicity in the business.

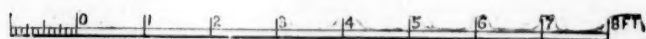
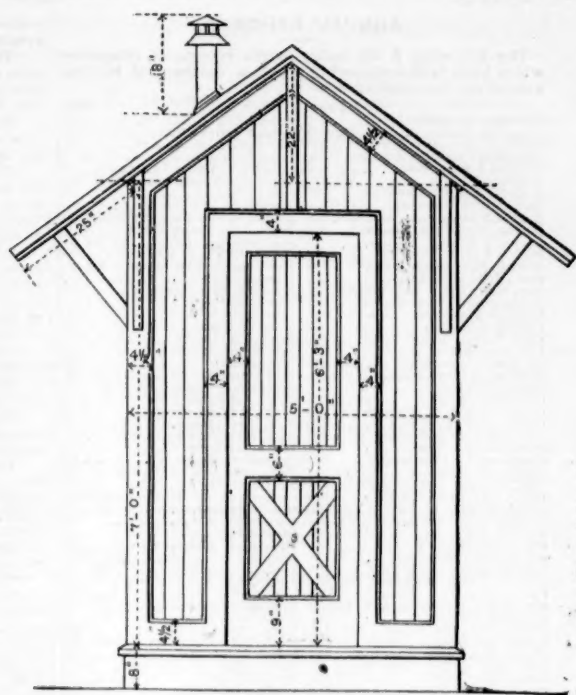
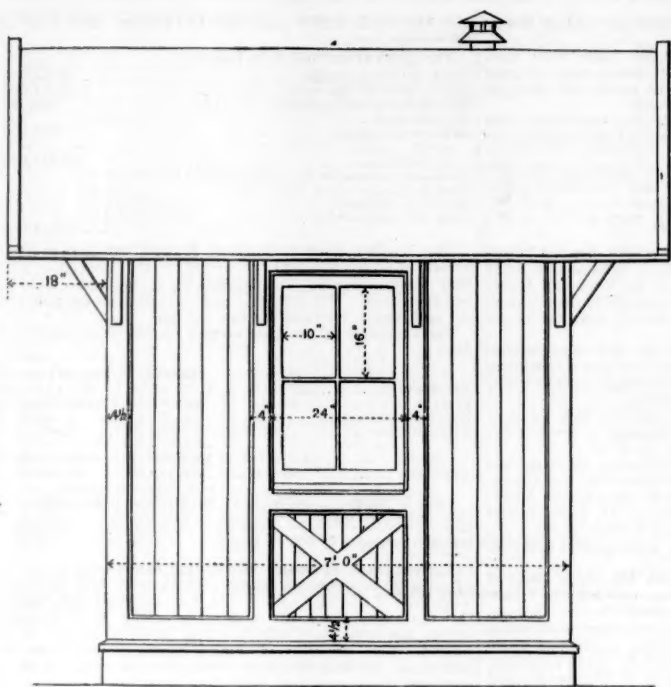
In the office were found the copy and proofs of the tickets on the Lake Shore road and also one Central Vermont Railroad ticket. The Lake Shore tickets are perfect imitations in every way, and could not be detected by conductors on that road even. They are way tickets, with blanks for the names of stations, and, as they were delivered to the forgers a month or more ago, have doubtless before this time yielded them a rich harvest.

Superintendent Rogers and the officers of the company had a consultation concerning the detection of the counterfeits. From certain facts that came into the possession of the Superintendent he made up his mind that the guilty men were in Chicago, and telegraphed, as already stated, with the result of effecting the arrest of two men, who are believed to be the right ones. Mr. Snow received a dispatch yesterday afternoon, before starting for Chicago, stating that the two prisoners had acknowledged their guilt and explained the full details of the scheme. It is now thought that there will be found to be three distinct places claiming the prisoners, if they should prove to be the right men. A gang has been working the ticket system in Chicago, one has been working here and one has been working in Toledo. The inference is that all three gangs are identical and that the two men, Faucet and Tilden, comprise it. The Toledo counterfeiting was of passes entirely, and the Chicago counterfeiting was of passes and tickets, and the forgers were never detected. It is also stated that one of the men, probably Faucet, had been employed in a Buffalo railway printing-office, but this cannot be asserted with any positiveness, owing to the fact that the names used here are no doubt fictitious.

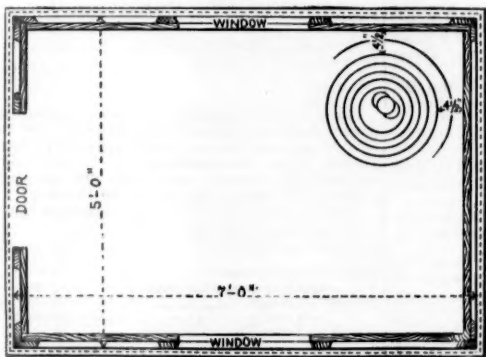
If the men are identical with those of whom Mr. Snow has heard, one of them has been in prison twice before; once for forgery and once for getting money under false pretences.

Standard Tool-Houses and Watch-Box for Pennsylvania Railroad.

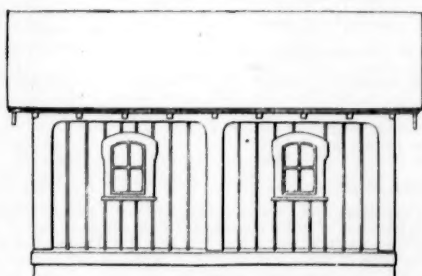
Our engraving represents the standard sizes and forms for these structures used on the Pennsylvania Railroad. The illustrations are so complete that no further description is required.



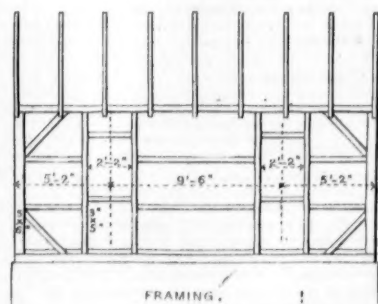
STANDARD WATCH-BOX, PENNSYLVANIA RAILROAD.



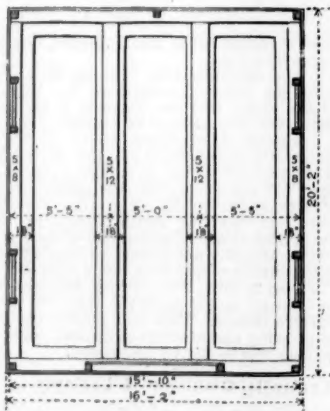
FRONT ELEVATION.



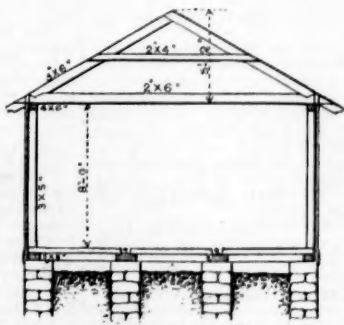
SIDE ELEVATION.



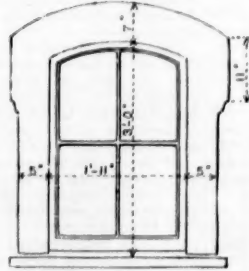
FRAMING.



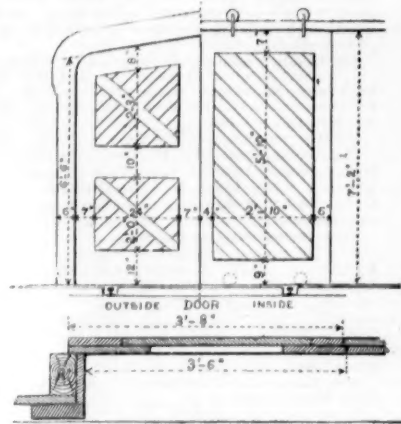
GROUND PLAN.



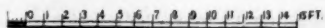
SECTION.



PLAN OF HALF OF WINDOW.



PLAN OF HALF OF DOOR.



FOREMAN'S STANDARD TOOL-HOUSES, PENNSYLVANIA RAILROAD.

[The size indicated by A is for the main line; B and C for branch roads.]

ANNUAL REPORTS.

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Chesapeake & Ohio.

This company owns a line from Richmond, Va., to Huntington, W. Va., 427.79 miles, with 6.81 miles of short branches, making 434.60 miles in all. The following information for the year ending Sept. 30, 1880, is from a circular issued by the fiscal agents of the company.

The equipment consists of 88 locomotives; 31 passenger, 5 sleeping and parlor and 15 baggage, mail and express cars; 870 box, 1,211 coal, 570 gondola, 126 flat, 111 stock, 20 coke and 55 caboose cars, 2 officers' cars, 1 pay car, 3 derrick, 25 shanty and 137 gravel cars.

The stock and bonds are as follows:

First-preferred stock.....	\$6,347,803.00
Second-preferred stock.....	7,646,315.00
Common stock.....	15,006,138.02
Total stock (\$28.799 per mile).....	\$29,990,256.02
Prior lien bonds.....	1,042,719.61
Purchase money funding bonds.....	1,048,001.00
Six per cent. gold bonds, Series A.....	1,341,000.00
Series B.....	15,000,000.00
Six per cent. currency bonds.....	10,122,500.00
Total bonds (\$65.357 per mile).....	\$28,404,219.61
Total (\$134.156 per mile).....	\$58,394,475.63

On the Series B gold bonds interest until Nov. 1, 1881, is payable in first-preferred stock; then for one year half in the same stock, for one year one-third in the same stock, and thereafter in money. On the currency bonds interest till Nov. 1, 1884, is payable in second-preferred stock; then interest for one year payable two-thirds in second-preferred stock, for one year one-third in the same stock, and afterwards such proportion as may be earned in money, the balance in stock.

The freight traffic for the year was as follows:

Tons freight moved.....	1879-80..... 941,124	1878-79..... 686,523	Increase..... 254,598	P. c..... 37.2
Tonnage mileage.....	230,219,551	107,833,065	62,386,486	37.2
Av. rate per ton per mile.....	0.8800 ct.	0.8625 ct.	0.0175 ct.	2.0

The average rate per ton per mile for seven years has been, in cents: 1873-74, 1.50; 1874-75, 1.48; 1875-76, 1.20; 1876-77, 1.10; 1877-78, 0.98; 1878-79, 0.86; 1879-80, 0.88. Last year showed a slight recovery from the continuous decrease.

The earnings were as follows:

Freight.....	1879-80..... \$2,020,094.23	1878-79..... \$1,457,424.02	Increase..... \$562,670.21	P. c..... 38.6
Passengers, etc.....	494,115.58	434,118.25	60,033.33	13.8
Total.....	\$2,514,245.81	\$1,891,542.27	\$622,703.54	32.9
Expenses.....	1,944,950.90	1,507,332.67	437,618.23	29.0
Net earnings.....	\$569,288.85	\$384,209.60	\$185,079.25	48.2
Gross earn. per mile.....	5,785.19	4,352.38	1,432.81	32.9
Net earn. per mile.....	1,309.91	884.05	425.86	48.2
Per cent. of exps.....	77.36	79.69		

The increase was very large, both in traffic and earnings. The net earnings last year were equivalent to 2 per cent. on the funded debt, or 0.98 per cent. on the total stock and debt. They were a little over half the amount required to pay full interest on the prior lien and gold bonds.

The circular says:

"About 350 miles of the main track are laid with steel rails, and the iron rails on the remainder are being replaced

with steel, out of the current revenues of the road, as fast as renewals become necessary.

"It is contemplated to renew the entire track with steel rails during the next year, after which the average annual charge for maintenance of way will be much less than at any time since the completion of the road.

"The cost of relaying the track with steel rails has been paid entirely out of the earnings of the road, and included in the operating expenses.

"The amounts paid out and charged to operating expenses for new steel rails during each of the last four fiscal years have been as follows, viz.: For the year ending Sept. 30, 1877, \$95,358.71; 1878, \$82,570.54; 1879, \$177,140.07; 1880, \$206,723.40.

"The company have made arrangements for the immediate construction of a road from their present line near Richmond, down the peninsula between the York and James rivers, to Newport News, which is located on the deep waters of the Chesapeake Bay, at Hampton Roads, near the Capes of Virginia and the open sea.

"Ample means have been provided for the construction of this road and for the erection of wharves and warehouses at Newport News, and the work will be commenced at once, and completed within the next six months.

"The length of road required to be built for this purpose is about 75 miles. As the route lies through a level, tide-water country, it can be rapidly built.

"The Elizabethtown, Lexington & Big Sandy Railroad has been recently completed from the junction with the Chesapeake & Ohio at the Big Sandy River, 8 miles below Huntington, to Ashland, Ky., on the Ohio River, 15 miles below Huntington, and trains are now running to that point.

"The distances intervening between Ashland and rail connections west are as follows, viz.:

"From Ashland to Portsmouth, O., on the north bank of the Ohio River, where connection will be made with the Scioto Valley Railroad for Chillicothe, Columbus, Toledo, Chicago and the northwest, about 33 miles. Parties interested in the Scioto Valley Railroad are now building a railroad from Portsmouth to a point opposite Ashland, to form a connection with the Elizabethtown, Lexington & Big Sandy and the Chesapeake & Ohio, which will be completed within three months.

"From Portsmouth to Cincinnati, about 110 miles.

"From Ashland to Cincinnati, by either the Kentucky or Ohio bank of the river, about 140 miles.

"To complete the connection with Louisville by the Big Sandy route, about 75 miles of road are still to be built, which is under contract. A connection with the Ohio & West Virginia at Gallipolis could also be made by building about 35 miles through the Kanawha Valley.

A new eastern connection is expected shortly from the completion of the Shenandoah Valley road to Waynesboro.

Manhattan.

This company operates all the elevated railroads in New York under lease. The following statement was presented at the annual meeting in New York this week:

The following statement exhibits, for your information and study, a summary of the business of this company for the fiscal year ending Sept. 30, 1880:

Gross earnings (\$170.851 per mile).....	\$4,612,975.56
Operating expenses.....	2,644,325.24
Net earnings (\$72.846 per mile).....	\$1,968,650.32
Fixed charges.....	2,458,958.33

Showing the loss during the year of..... \$490,306.01

The "surplus" on Oct. 1, 1879, was..... \$61,216.57

Deficiency Oct. 1, 1880..... \$189,091.44

The following statements of the results of this year compared with those of the year preceding, and a few general remarks pertaining thereto, may prove of interest.

The gross earnings were:

For the year ending Oct. 1, 1879.....	\$3,500,000
For the year ending Oct. 1, 1880.....	4,600,000
Increase, 33 per cent.....	\$1,100,000

The total passengers carried were:

For year ending Oct. 1, 1879.....	45,900,000
For year ending Oct. 1, 1880.....	60,800,000
Increase, 33 per cent.....	14,900,000

The average number of miles operated was:

For year ending Oct. 1, 1879.....	20 miles
For year ending Oct. 1, 1880.....	27 miles
Average increase, 35 per cent.....	7 miles

The total mileage Oct. 1, 1879, was..... 23 miles

The total mileage Oct. 1, 1880, was..... 32 miles

Increase..... 9 miles

The net earnings were:

For year ending Oct. 1, 1879.....	\$1,556,000
For year ending Oct. 1, 1880.....	1,968,000
Increase, 26 per cent.....	\$412,000

The passengers and gross earnings have kept pace with the average increase of miles operated during the year, as it is evident that the increase of the city travel must necessarily be on the lines of these roads. The expenses of operating and maintaining have been about 57 per cent. of the gross earnings for the year. Loss of traffic consequent upon the rebuilding of the Ninth avenue line and the completion of the Second avenue line to Sixty-seventh street enlarged the expenses. The roads have facilities now for carrying more passengers than they do without materially increased expenses.

The direct benefits resulting to the Manhattan Company from the added mileage are shown in a decreased capitalization per mile operated and a proportionate reduction required to be paid by this company. The shareholders' franchise will be of greatly increased value, arising from connections to be made with the trunk roads at the upper end of the island, which should add largely to the revenues.

Of the 61,000,000 passengers carried during the year none have been killed or injured through the fault or carelessness of the company's agents. The newly devised rules will afford passengers additional protection.

With economy the stockholders of the Manhattan Company may look forward to largely augmented net earnings, and an enhanced value of its securities.

Chicago & Eastern Illinois.

This company's third yearly report covers the year ending Aug. 31, 1880. The line owned is from Dolton, Ill., to Danville, 107.5 miles, and the Indiana Division, from Bismarck to Coal Creek, Ind., 24 miles. The company also leases the use of the Columbus, Chicago & Indiana Central track from Dolton into Chicago, 20.5 miles, from the Pittsburgh, Cincinnati & St. Louis Company, making 152 miles worked throughout the year.

From May 1, 1880—four months of the year—the company also leased the Evansville, Terre Haute & Chicago road, from Danville, Ill., to Terre Haute, Ind., 55 miles. The earnings of this leased line are stated separately.

The equipment consists of 42 locomotives; 10 passenger, 3 mail and smoking and 7 baggage cars; 545 box, 3 refrigerator,

tor, 111 stock, 1,252 coal and 18 caboose cars; 1 pay car, 20 service cars.

The general account is as follows:

Stock (\$2.533 per mile).....	\$333,054.18
Bonds (\$28.753 per mile).....	3,714,329.16
Bills and accounts payable.....	258,560.31
Sinking fund.....	750.00
Balance of income.....	204,958.50

Total..... \$4,511,680.15

Road and equipment (\$31.379 per mile)..... \$4,136,348.24

First-mortgage bonds held by Co..... 75,000.00

Materials and fuel..... 127,407.87

Cash and receivables..... 172,924.04

4,511,680.15

The bonded debt consists of \$3,000,000 first-mortgage bonds, of which \$75,000 are owned by the company; \$706,900 income bonds, and \$7,429.16 scrip convertible into income bonds. The bills and accounts payable include interest and rentals accrued but not yet due.

The earnings of the line owned for the year were as follows:

	1879-80.	1878-79.	Inc. or Dec.	P. c.
Passengers.....	\$139,133.51	\$108,018.80	I.	\$31,114.71 28.8
Freight	816,457.77	668,381.10	I.	148,076.67 18.1
Mail and express....	26,231.45	26,475.99	D.	244.54 0.9
Miscellaneous.....	38,971.83	29,023.29	I.	9,948.54 34.3

Total..... \$1,020,794.56

Expenses..... \$642,065.30

Net earnings..... \$378,729.26

Gross earn. per mile..... 5,785.19

Net..... 2,487.09

Per cent. of exps..... 62.95

Over the expenses increased only 5.7 per cent., with an increase of over 25 per cent. in traffic. There were laid during the year 76,587 oak ties and 3,181 tons of steel rail, making the main line track all steel. The entire line, except 18 miles, has been well ballasted, and bridges thoroughly repaired. The expense of maintenance of cars has been heavy, on account of the poor condition of many of the old cars and the severe test that they have been put to enable the company to handle the traffic offered during the past year.

The operations of the leased line for the four months were as follows:

Gross earnings (\$2,136.21 per mile).....	\$117,491.51
Expenses (89.65 per cent.).....	105,734.02
Net earnings (\$213.77 per mile).....	\$11,757.49
Interest and track rentals.....	30,000.00
Deficit.....	\$18,242.51

Since taking possession of this division there have been placed in the track 34,848 oak ties and 676 tons (7.7 miles) of steel rails, all included in the operating expenses, as shown above. Large expenditures will be necessary on the same account the coming year to put the property on an equal footing with that of the Main Line Division.

The income account, condensed, was as follows:

Gross earnings, Main Line.....	\$1,020,794.56
Working expenses.....	\$631,249.97
Taxes.....	11,315.54
Rental of leased tracks.....	66,700.00
" of depot grounds, Chicago.....	7,384.85
Interest on bonds.....	173,160.00
" on loans.....	6,345.33
Deficit on Terre Haute Division.....	18,242.51
	\$14,496.30

Surplus for the year..... \$106,298.26

Balance, Sept. 1, 1879..... 98,690.24

MICHIGAN MINOR RAILROADS IN 1879.

NAME OF ROAD	PROPERTY.					CAPITAL.			EARNINGS.				PAYMENTS FROM NET EARNINGS.	
	Miles owned.	Miles leased.	Loco-motives.	Pass. train cars.	Freight cars.	Stock.	Bonds.	Other debt.	Gross Earnings.	Expens.	Net earnings.	Gross earn. per mile.	Net earn. per mile.	P. c. of exps.
Chicago & Canada Southern.....	67.6		2	1	41	\$2,677,400	\$3,696,831	\$8,470	\$64,920	\$87,120	\$22,200	\$326		129.4
Chicago, Saginaw & Canada.....	38.0		4	4	58	286,000	195,000	470,000	60,909	41,382	19,527	1,892	\$313	67.9
Detroit & Bay City.....	145.1		14	16	316	1,325,750	2,005,500	779,410	472,072	282,901	189,171	3,139	1,278	59.9
Detroit, Hillsdale & Southwestern.....	64.8		5	2	52	1,346,000	26,210		60,425	63,830	\$3,405	982		105.6
Ft. Wayne, Jackson & Saginaw.....	100.0		10	9	344	1,149,950	2,707,461	48,500	256,724	195,584	61,140	2,567	611	74.2
Grand Haven.....	57.5		4	5	95	860,000	178,944	39,255	60,705	69,236	\$8,531	1,056		112.2
Grand Rapids, Newaygo & Lake Shore.....	46.0		4	5	230	528,100	770,000	288,690	124,445	64,790	59,655	2,705	1,297	52.3
Hecla & Torch Lake.....	4.5		1	1	155	100,000		73,061	37,625	39,843	\$2,218	8,360		106.0
Hobart & Manistee.....	9.2		2		42	60,000		15,727	5,842	3,852	1,900	632		66.0
Lake George & Muskegon River.....	21.2		4		75	98,500		3,466	109,095	56,304	52,791	5,144	2,489	51.8
Marquette, Houghton & Ontonagon.....	85.6		30	9	1,741	4,565,627	4,186,200	23,590	549,093	279,928	279,165	6,414	3,179	50.1
Michigan Air Line.....	26.1		2	2	22	300,000	15,573	66,691	21,208	21,691	\$483	813		104.4
Michigan Midland & Canada.....	15.0		1	1	4	300,000	448,870	7,664	4,280	7,223	\$2,937	286		168.5
Mineral Range.....	12.5		3	4	56	75,400	200,000	69,154	88,863	56,247	32,616	7,109	2,609	63.0
Muskegon River & Rose Lake.....	7.5		1		13	25,400			9,809	9,558	1,316	108		91.8
Paw Paw.....	4.0		1		13	75,000	3,000		8,087	5,513	2,574	2,172		79.4
Pinconning.....	25.0				61	1,000	96,000	86,271	19,285	31,772	\$12,487	941		164.7
Port Huron & Northwestern.....	25.3		2	3	3	100,000	125,000	23,498	12,387	7,344	5,043	491		59.0
Saginaw Valley & St. Louis.....	35.6		4	3	51	255,300	446,000	41,641	78,255	51,997	26,258	1,906	670	66.8
Toledo & Ann Arbor.....	45.1		3	5	31	559,181	755,600	44,044	49,529	48,321	1,208	1,099		96.6
Toledo & South Haven.....	9.0		2	2	5	29,698	15,000	15,799	4,283	3,733	550	476	61	87.0
Traverse City.....	26.0		1		10	205,000	250,000	103,966	24,000	21,273	2,727	923	105	87.9

* Deficit.

† Owned by Calumet & Hecla Mining Co.

‡ Logging, or lumber roads.

§ Unfinished and under construction.

These figures are from the reports made to the Railroad Commissioner of Michigan for the year 1879, and are for all roads which do not otherwise report. The reports give the amount of interest accrued, but do not say whether it was paid or not.

Hecla & Torch Lake is 4 ft. 1 in. gauge; Hobart & Manistee, 3 ft. 6 in.; Mineral Range, Muskegon River & Rose Lake, Paw Paw, Port Huron & Northwestern and Toledo & South Haven, 3 ft.; all others, standard gauge.

properties being added or deducted under the head of taxes and rentals. The report is for the year ending June 30, 1880.

The equipment consists of 32 locomotives; 28 passenger, 2 postal, 9 baggage and mail and 6 express cars; 244 box, 131 stock, 45 gondola, 91 flat and 10 caboose cars; 1 pay car, 1 wrecking, 1 derrick, 8 boarding and 21 gravel flat cars; 35 hand and 49 truck cars.

The general account, condensed, is as follows:

Preferred stock.....	\$1,364,591.49
Common stock.....	496,011.58
Total stock (\$10.638 per mile).....	\$1,860,603.07
Bonded debt (\$21.525 per mile).....	3,764,700.00
Bills payable.....	82,315.98
Accounts payable, July coupons.....	343,349.76
Cumberland & Ohio construction fund.....	93,177.12
Unadjusted account with Receiver.....	3,617.66
Profit and loss, balance.....	14,567.28
Total.....	\$6,389,370.87
Road, etc. (\$34,279 per mile).....	\$5,965,352.59
Sundry assets, cash, receivables, etc.....	290,692.06
Due from leased lines, etc.....	17,241.49
Stocks, bonds, etc.....	43,509.74
Steel rails.....	42,574.48
Total.....	\$6,389,370.87

The bonded debt consists of \$2,900,000 first-mortgage 7 per cent. bonds, \$764,700 second-mortgage 7 per cent. bonds, and \$100,000 Louisville city 6 per cent. bonds.

The earnings for the year were as follows:

	1879-80.	1878-79.	Increase.	P. c.
Passengers.....	\$433,980.45	\$371,579.35	\$62,401.10	16.8
Freight.....	618,527.89	510,291.87	108,236.02	21.2
Mail and express.....	71,738.04	71,330.30	407.74	0.6
Miscellaneous.....	5,385.38	5,009.75	375.63	7.5
Total.....	\$1,129,632.36	\$958,121.27	\$171,511.09	17.9
Expenses.....	704,361.49	633,196.24	71,165.25	11.2
Net earnings.....	\$425,270.87	\$324,925.03	\$100,345.84	30.9
Gross earn. per mile.....	6,458.73	5,478.11	980.62	17.9
Net earn. per mile.....	2,431.51	1,857.78	573.73	30.9
Per cent. of exps.....	62.35	66.02		

The large increase in earnings was due to the increase in business, and was made in spite of a decrease in rates. Expenses increased on account of greater train movement and higher prices of fuel and supplies of all kinds. The proportion of expenses was, however, somewhat less than in the preceding year.

The income account was as follows:

Gross earnings.....	\$1,129,632.36
Expenses.....	\$704,361.49
Taxes and rentals.....	3,094.46
Interest.....	266,501.76
Premium on bonds bought for sinking fund.....	5,817.58
Balance for the year.....	\$149,887.07
Balance of profit and loss, July 1 1879.....	91,680.21
Balance, July 1, 1880.....	\$241,567.28

The amount of taxes and rentals in the amount of those charges in excess of the earnings of the leased lines. The yearly interest charged on the bonded debt is \$262,529.

The traffic for the year was as follows:

	1879-80.	1878-79.	Increase.	P. c.
Passengers carried.....	305,673	330,944	25,271	7.6
Passenger mileage.....	15,484,860	12,984,240	2,500,620	19.3
Tons freight carried.....	403,833	319,271	84,562	26.5
Tonnage mileage.....	34,222,143	28,339,773	5,882,370	20.8
Av. receipt:				
Per pass. per mile.....	2.803 cts.	2.874 cts.	D. 0.071 cts.	2.5
Per ton per mile.....	0.870 "	0.512 "	I. 0.358 "	69.9
Per ton per mile, net.....	1.807 "	1.800 "	I. 0.007 "	0.4
Per ton per mile, net.....	0.624 "	0.642 "	D. 0.018 "	3.7
Per train mile:				
Gross earnings.....	170,080	151,520	I. 18,560	12.2
Net earnings.....	64,080	51,380	I. 12,700	24.7
Passenger trains earned 131.32 cents per mile gross, and 53.50 cents net; freight trains, 221.42 cents per mile gross, and 77.46 cents net. The average above is for all revenue trains. Local business furnished 59.6 per cent. of the passenger mileage, and 28.5 per cent. of the tonnage mileage. The average rate per mile was for local passengers 3.070 cents; through, 2.409 cents; per ton per mile, local, 3.046 cents; through, 1.311 cents.				

The mileage and cost of repairs per car mile were:

	Miles run.	Repairs per mile, cents.
Passenger cars.....	959,624	1.578
Postal cars.....	170,900	0.063
Baggage and mail.....	413,296	0.903
Express cars.....	49,554	0.659
Freight cars.....	3,983,520	0.676
Road cars.....	308,315	0.080
Foreign passenger and baggage cars.....	70,179	0.065
Foreign freight cars.....	2,068,753	0.065
Pullman Palace cars.....	182,864	4.304
Pullman Southern cars.....	88,542	4.206

Other car expenses were 0.282 cent. per passenger car mile and 0.097 cent. per freight car mile.

Locomotive service cost 18.44 cents per mile run against 18.09 cents the previous year.

The freight tonnage per train mile increased 15.3 per cent. over the previous year. Of the freight train mileage eastward, 16.58 per cent. was empty and 83.42 per cent. loaded; westward, 22.33 per cent. empty, and 77.67 per cent. loaded.

During the year 3,643 tons steel rails, 204 tons new iron rails, and 863 tons partly worn iron rails were laid; 53,942 new ties were used. There are now 105,93 miles of track laid with steel, and 112 miles are fully ballasted. The road-bed has been improved and bridges and buildings kept in full repair with some additions.

There were added to the equipment 25 box, 13 fruit, 25 gondola and 1 wrecking car. Two mogul freight engines, and 2 parlor cars are nearly completed in the shops. A new foundry was built in Louisville.

Additions to construction account during the year were: Improvements of road and buildings, steel rails, etc. \$64,980.00 On account of new depot, Louisville..... 24,089.69 New equipment..... 55,590.18 Equipment bought from Shelby R. R. 12,571.75

Total..... \$157,201.62

On Aug. 1, 1879, the Shelby Railroad was leased for 30 years at a yearly rental of \$15,000, the equipment being bought for \$12,571.75. An agreement has been made to complete and lease for 80 years the Northern Division of the Cumberland & Ohio road, from Shelbyville to Bloomfield, 28 miles, the lessor company issuing \$250,000 first-mortgage bonds to this company. The bonds have been sold and the road nearly finished. The company has also bought for \$30,500, the Louisville, Harrods Creek & Westport road, from Louisville to Prospect, 11 miles. This road controlled an important entrance into Louisville, and might have become a troublesome competitor.

The company has received from the city of Louisville two squares of land on the river front, between Brook and Second streets; a new brick depot on this property has been nearly finished and the tracks laid. On the completion of this work the old depot on Jefferson street will be vacated, and the right-of-way on Jefferson street ceded to the city.

Missouri, Kansas & Texas.

This road consists of a main line from Hannibal, Mo., to Denison, Tex., 575.5 miles; a line from Holden, Mo., to Paola, Kan., 54 miles, and a line from Parsons, Kan., to Junction City, 156.5 miles, making in all 786 miles. The road is worked by the Union Trust Company, of New York, as trustee, in execution of an agreement between the company and its bondholders. Its report is for the year 1879.

The equipment consists of 88 engines; 34 passenger, 20 baggage and 5 postal cars; 798 box, 360 stock, 315 coal, 96 flat and 48 caboose cars; 1 pay, 1 business, 20 dump, 4 boarding, 1 magazine, 1 derrick, 1 tool and 1 pile driver car.

The bonded debt is stated as follows:

Union Pacific, Southern Branch bonds.....	\$2,315,000
Tebbo & Neesho bonds.....	349,000
Hann. & Central Mo. firsts.....	768,000
" seconds.....	32,000
M., K. & T. Consolidated bonds.....	14,752,000
" income bonds and scrip.....	7,571,553
Total.....	\$25,787,553

Holders of all but \$2,000 of the Southern Branch bonds, and all but \$53,000 of the consolidated bonds have become parties to the agreement. The second-mortgage income bonds represent coupons funded and preferred stock and scrip retired. There were \$12,000 Boonville Bridge bonds bought and retired.

The traffic for the year was as follows:

	1879.	1878.	Increase.	P. c.
Passenger.....	954,487	950,358	I. 4,129	0.4
Freight.....	1,777,144	1,610,651	I. 166,493	10.3
Total.....	2,731,631	2,561,009	I. 170,622	6.7
Total locomotive miles.....	2,910,484	2,950,176	D. 39,692	1.3
Passengers carried.....	296,652	265,473	I. 31,179	11.7
Passenger mileage.....	23,312,888	22,581,541	I. 731,347	3.2
Tons freight carried.....	676,785	490,060	I. 186,725	38.1
Tonnage mileage.....	142,418,284	118,190,343	I. 24,227,941	20.5
Average train load:				
Passengers, number.....	24.42	23.76	I. 0.66	2.8
Freight, tons.....	80.14	73.38	I. 6.76	9.2

The increase in freight traffic was very large, and in passenger business considerable.

Locomotive service cost 16.31 cents per mile, against 16.86 cents the previous year. The average cost per car mile was 3.80 cents for passenger and 1.33 cents for freight, the average passenger train being 4.7 cars and the average freight train 16.4 cars.

The average earnings and net earnings per train mile and per unit of traffic were, in cents:

	1879.	1878.	Increase.	P. c.
Per passenger train mile.....	74.880	28.370	I. 46.510	163.0
Per freight train mile.....	138.100	58.000	I. 80.100	138.1
Per passenger per mile.....	3.000	1.120	I. 1.880	167.9
Per ton per mile.....	1.724	0.725	I. 0.999	137.8

There was a decrease both in passenger and freight rates, but a gain in net earnings.

The earnings for the year were as follows:

	1879.	1878.	Increase.	P. c.
Passage.....	\$714,750.71	\$706,601.62	\$8,149.09	1.1
Freight.....	2,455,893.87	2,030,927.72	424,966.15	20.9
Mail and express.....	106,847.52	104,737.88	2,109.64	2.0
Miscellaneous.....	8,829.80	10,414.00	D. 1,584.20	18.1
Total.....	\$3,344,291.90	\$2,981,681.71	\$362,610.19	12.2
Expenses.....	1,975,519.50	2,302,739.21	D. 327,219.71	13.8
Net earnings.....	\$1,368,772.40	\$678,942.50	\$689,829.90	101.6

Gross earn. per mile.....	4,254.82	3,793.49	I. 461.33	12.2
Net earn. per mile.....	1,744.44	863.80	I. 880.64	101.6
Per cent. of exps.....	59.07	77.23	D. 18.16	2.4

There was paid from net earnings \$190,833.91, for permanent additions or improvements to property; \$37,498.82 for rental of equipment, and \$97,231.65 for taxes, a total of \$325,564.38, which, if added to expenses, would make them \$2,301,083.88, leaving a net balance of \$1,043,208.02.

The Trustee's account is as follows:

Gross earnings.....	\$3,344,291.90
Net proceeds land sales.....	51,063.30
" Denison cotton compress.....	27,101.34
Interest allowed by Trust Co.....	3,615.05
From Houston & Texas Central notes.....	190,445.98
Total.....	\$3,610,517.63
Total expenditures.....	\$2,466,621.27
Coupons and interest.....	811,491.93
Account of cotton compress.....	15,726.85
Purchase of Boonville Bridge stock.....	65,000.00
Balance for the year.....	\$317,677.88
Balance, Dec. 31, 1878.....	139,622.31
Balance, Dec. 31, 1879.....	\$457,300.19

The Land Department reports 53,542 acres sold during the year, for which \$113,789.83 was received, whereof \$70,123.94 was paid in cash and \$8,088.30 in bonds, while \$31,577.58 remains on contracts. Total receipts from lands were, in cash, \$107,191.21, in bonds \$4,349.37. Expenses, including taxes, were \$47,052.46.

During the year the tolls on the Boonville Bridge were \$105,814.07; expenses, \$7,852.70, leaving a balance of \$97,961.37 for the year. Some repairs and general painting are needed.

The suit so long pending with the Kansas Pacific in relation to the ownership of certain lands has been finally decided in favor of the Kansas Pacific.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMN. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE CHICAGO PASSENGER WAR.

Two weeks ago the passenger war, begun by the action of the Wabash in charging a dollar a ticket less out of Chicago than the other roads, seemed to have come to an unusually early close, with results that seemed to justify the strategy of the Wabash in beginning the campaign; a treaty of peace had been made which, as reported, gave it a position in Chicago such as it could hardly hope to attain in the ordinary course of business until it had perfected its entrance into that city. But if then the war seemed one of the most successful on record, now it is the treaty of peace which deserves the distinction of being one of the greatest failures. It hardly seems credible, but the statements of the different parties leave no room for doubt, that the leading officers of the several companies after several days' negotiations made an agreement so indefinite that they cannot now agree as to what its terms were, and disagree even as to its most important features—the very essentials which we would suppose to be settled beyond controversy. The Chicago & Alton understands the agreement in one way, and the Wabash in a very different way, and the consequence is that the war is raging as fiercely and widely as ever, with greater obstacles to its settlement than there were in the first place.

Enough room for trouble was left by the failure of the New York meeting to provide for "the details" of the settlement. These were left for the general managers to attend to. But the most difficult matters of all were included in these details, and even if the companies had actually agreed upon something—which it seems they did not do, though they supposed they had done so—to carry out their purposes would tax the ingenuity of their officers, and would require new agreements, including other companies than those represented at the New York meeting.

At first the chief complication seemed to be due to

the issue of unlimited tickets between Chicago and St. Louis by the Wabash and between St. Louis and Kansas City by the Chicago & Alton. It should be noticed that these companies issued unlimited tickets only between places where their traffic was, and for some time was likely to be, very light. They, doubtless, felt that they were spoiling for a long time the business between those places, but were indifferent, because neither had much business of the special kind it was engaged in spoiling. The Wabash had not fairly got into Chicago, and could not expect to have a large share of the Chicago-St. Louis travel until it had, and if the sale of unlimited tickets at five dollars should cause large losses to the Chicago & Alton and the Illinois Central for two or three months to come, it could afford to be indifferent. And so the Chicago & Alton, though well established between St. Louis and Kansas City, and commanding a full share of the freight traffic, has a circuitous route for passengers, and probably under ordinary circumstances gets but a small share of them; but the Wabash has a short line between the two places and a large share of the travel, and a third road, the Missouri Pacific probably a still larger share; and as some of the active directors of the Wabash are also connected with the Missouri Pacific, probably the Chicago & Alton calculated that what hurt it would have some effect on the Wabash as well as the direct injury inflicted on the latter. Thus the two companies succeeded in doing great injury to a leading part of each other's passenger business, though a different traffic on each, and when they come to desire peace they find it made difficult by this action. The Chicago & Alton, which has had probably three-fourths of the Chicago-St. Louis travel, had to carry at \$5 instead of \$8.70, and the Wabash, which had a large St. Louis-Kansas City travel, got but \$5 instead of \$8.50 per ticket.

It is not easy to see why there should be any objection to maintaining rates while the unlimited tickets are being worked off, provided the interests of the several outside parties are protected. All these unlimited tickets will have to be honored, and the sooner they are used up the less the injury to the business. If the roads make a \$5 rate to meet the competition of the unlimited tickets they have themselves sold, the speculator will have no inducement to sell off his stock, and the tickets may be in the market for three years to come; but if the railroads hold their rates firmly, the speculators can make a good profit on their tickets and will sell them rapidly, and probably for some time scarcely any other tickets will be sold. But since the tickets must be honored some time, this will make no difference to the railroads.

That, however, the roads outside of the fight, like the Illinois Central and the Missouri Pacific, should have to lie out of business while these tickets are being worked off, without being offered any indemnity, seems altogether unjust.

But all this trouble as to unlimited tickets becomes a mere trifle in view of the failure of the different companies to understand alike the main terms of the agreement—the proportions of the traffic which the several roads were to get. This resolves things into their original chaos, from which order can be brought only by making a new agreement, and one which all the parties will understand alike.

The war, so far, seems to be taking nearly its original course, with the exception that no one is selling unlimited tickets, and, by the latest news, rates had not gone quite so low as before. The Chicago & Alton has resumed its tactics of breaking down rates from St. Louis to the East by selling tickets by way of the Lake Erie & Western at nominal rates. In this way it affects rates over the whole length of the Wabash from Kansas City to Toledo, and injures the lines over which they are sold comparatively little, because they have had very little of this Eastern business. The Wabash, as before, inflicts the greatest injury by destroying the value of the business between Chicago & St. Louis, which is of most importance to the Chicago & Alton. Latterly all the roads from St. Louis to the East have followed the cut by the Chicago & Alton and Lake Erie & Western, which demoralizes the whole through business.

The time is perhaps a favorable one for carrying on a war against dividend-paying roads. Their prosperity, instead of making them bold, rather makes their managers timid. It is not that they fear any real financial disaster, but that the prices of stocks have gone up enormously, and holders have in many cases extravagant expectations of dividends. Managers who know that their stockholders, under the most favorable circumstances, are likely to be disappointed, are anxious to avoid the appearance of any conduct that might reduce dividends. In this, roads that are not yet dividend-paying have an advantage.

Grain Movement for Ten Months.

The receipts and shipments of grain of all kinds at the great Northwestern markets, St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Cleveland and Toledo, and the receipts at the seven Atlantic ports have been, in bushels, for the ten months ending with October of the past six years:

	Northwestern		Atlantic
	Receipts.	Shipments.	receipts.
1875.....	127,601,424	104,593,943	112,930,250
1876.....	147,134,397	130,104,494	138,579,592
1877.....	145,146,721	122,017,392	133,913,948
1878.....	196,559,591	155,930,051	214,301,988
1879.....	209,735,834	175,430,037	245,689,421
1880.....	248,991,684	210,193,761	257,508,127

In every respect, therefore, the movement has been larger this year than ever before, and, compared with last year, there is an increase of 19 per cent. in the receipts and 19½ per cent. in the shipments of the Northwestern markets, and of nearly 5 per cent. in the Atlantic receipts. These latter, it will be noticed, are not so much larger than the Northwestern shipments as they have been in the two previous years. The excess in the several years named has been:

1875.....	8,336,307	1878.....	58,371,937
1876.....	6,475,098	1879.....	70,259,384
1877.....	11,896,586	1880.....	47,344,366

The immense increase after 1877 was doubtless due to large shipments through by rail from interior local points not passing through any of the reporting markets. The falling-off this year is probably due to the larger proportion of lake shipments, which are all reported.

For the same ten months, ending with October, the receipts of grain of all kinds (flour not included) at the seven Atlantic ports have been, in bushels, for the past five years:

	1876.	1877.	1878.	1879.	1880.
New York.	59,863,359	61,923,475	107,971,411	112,278,150	121,833,633
Boston....	10,900,840	11,535,477	15,491,439	17,655,257	20,045,116
Portland..	1,887,612	889,843	1,603,632	1,116,539	2,104,440
Montreal..	11,492,943	11,875,724	12,427,473	13,438,599	15,235,343
Philadel..	26,678,675	17,621,929	33,235,761	40,118,025	38,767,075
Baltimore	21,072,624	23,065,384	34,167,001	50,596,455	44,729,417
N. Orleans	4,334,036	5,245,327	9,132,951	9,784,090	17,081,295
Total....	139,769,124	184,088,123	214,250,515	244,986,672	259,755,819

In the total this year shows an increase of 6 per cent. over 1879, 21¼ per cent. over 1878, 94 per cent. over 1877, and 86 per cent. over 1876. The increase over last year is thus comparatively moderate. It is, indeed, considerably less than it was at the end of July, of August, and of September, the seaboard receipts of late months having been less than in the corresponding months of last year, as the following statement will show:

	1880.	1879.	1878.	1877.
May.....	21,533,737	21,020,131	29,018,672	10,062,572
June.....	33,236,414	24,593,630	18,831,973	12,722,544
July.....	42,657,033	28,550,851	20,935,883	11,071,017
August....	31,425,378	31,115,615	26,583,730	17,453,798
September	25,411,425	28,964,840	26,901,530	19,981,624
October....	36,194,528	40,428,143	31,899,417	29,478,109

At the end of May the Atlantic receipts were about the same this year as last (90,832,000 bushels against 91,334,000). But this year the June and July receipts were very much greater than last year, and the July receipts were larger than those of any fall month have ever been, or any other month in any other year. This tremendous midsummer movement, it now seems, was made at the expense of the fall movement, which so far has been only about equal to the midsummer movement of last year, and materially lighter than last year. Until this year, it will be observed, the October receipts have been much larger than those of any other month. The fall movement, however, has not been light this year, only lighter than last year and than the summer movement of this year.

Returning to the table of receipts at the several ports, we observe that there has been a decrease, compared with last year, of 3½ per cent. at Philadelphia and one of 13 per cent. at Baltimore, but increases everywhere else, greatest in amount at New York and in percentage at Portland (88½ per cent.) and New Orleans (75 per cent.) The gain at New Orleans is just about equal to the loss of Philadelphia and Baltimore together, and is 2,200,000 bushels less than the gain at New York.

If we go back to 1876, we find a gain at every place, in the aggregate amounting to 120,000,000 bushels. The amount and the percentage of this increase at each place since that year has been:

	Bushels.	Per cent.
New York.....	61,980,274	51.6
Boston.....	9,095,276	7.6
Portland.....	216,798	0.2
Montreal.....	3,742,805	3.1
Philadelphia	12,088,400	10.1
Baltimore.....	20,656,793	17.2
New Orleans..	12,247,259	10.2
Total.....	120,027,695	100.0

It appears from this that New York has succeeded in attracting more than half of the immense increase in the grain receipts that has occurred since 1876, which is sufficient evidence that in the aggregate its advantages continue to be greatest. It is not true, however, that the rate of growth has been greater at New York than at any other place. This rate of growth from 1876 to 1880 was 108½ per cent. at New

York, indeed, but 253 per cent. at New Orleans, 86 at Baltimore, 83½ at Boston and 45 per cent. at Baltimore, and in the aggregate it was 86 per cent. Only New York and New Orleans are above the average.

The percentage of the total receipts at each point each year has been:

	1876.	1877.	1878.	1879.	1880.
New York.....	42.8	46.2	50.4	45.8	46.9
Boston.....	7.8	8.6	7.3	7.2	7.7
Portland.....	1.4	0.7	0.7	0.5	0.8
Montreal.....	8.2	8.8	5.8	5.5	5.9
Philadelphia.....	19.1	13.4	15.5	16.4	14.9
Baltimore.....	17.2	17.6	16.0	20.6	17.2
New Orleans.....	3.5	4.7	4.3	4.0	6.6
Total.....	100.0	100.0	100.0	100.0	100.0

New York's percentage is larger this year than in any other except 1878, Philadelphia's is smaller this year than in any other except 1877. Baltimore's was smaller only in 1878, but was the same in 1876. New Orleans has a larger proportion than ever before.

Comparing New York with Philadelphia and Baltimore together we have the following percentages:

	1876.	1877.	1878.	1879.	1880.
New York.....	42.8	46.2	50.4	45.8	46.9
Philadelphia and Baltimore.....	36.3	31.0	31.5	37.0	32.1
The three cities.....	79.1	77.2	81.9	82.8	79.0

Comparing New York and Boston together with Philadelphia and Baltimore together, we have:

	1876.	1877.	1878.	1879.	1880.
New York and Boston.....	50.6	54.8	57.7	53.0	54.6
Philadelphia and Baltimore.....	36.3	31.0	31.5	37.0	32.1
The four cities.....	86.9	85.8	89.2	90.0	86.7

There is left but one more month during which the main channel of New York receipts remains open this year, and after November it will have only such a proportion of the business as its railroads can command. Before navigation opened this year it had received but 86½ per cent. of the grain, and in five months since it has had on the average 50 per cent. of it. The fluctuations in the proportions received at the several ports in successive months this year is shown more completely below:

	New York.	Boston.	Portland.	Montreal.	Philadelphia.	Baltimore.	New Orleans.
January.....	37.5	11.2	3.8	0.4	11.9	18.9	16.3
February.....	32.5	12.6	1.4	0.5	10.7	21.3	12.0
March.....	40.2	7.8	2.0	0.3	17.4	22.8	9.5
April.....	34.8	9.5	1.5	0.3	21.0	21.7	11.2
May.....	56.1	6.4	0.1	7.0	16.8	8.7	4.9
June.....	39.4	6.7	0.2	7.7	19.0	13.1	3.9
July.....	50.5	6.6	0.4	5.9	12.8	19.4	4.4
August.....	42.8	8.4	0.6	11.9	11.9	20.8	3.6
September.....	54.0	7.2	0.4	8.7	9.2	13.6	6.9
October.....	53.2	6.1	0.2	6.5	14.4	15.2	4.4

When navigation is closed Montreal is virtually out of the market, but Portland comes in its place. But it is then that Boston, Philadelphia and Baltimore usually get a share of the traffic that when navigation is open the canal takes to New York. Then, too, the shipments by the Mississippi are likely to be largest, but only when rail rates are higher. Last year the rail rate of 40 cents per 100 lbs. encouraged shipments down the Mississippi and consequently New Orleans receipts. Whatever advantage there may be in shipping by that route, it will be less when rail rates are low than when they are high; and it is probable that the availability of this route will serve to keep down rail rates hereafter. It is true it did not last winter, but then the stock of barges provided was not sufficient to carry any large proportion of the grain. If the business then and since has been profitable, we should expect the facilities by this route to have been largely increased. It is to be remarked, however, that while the rail rate has been 35 and 30 cents, the shipments down the river have been less than they were last winter, though the total shipments have been larger than before, and an unusually large part of them have come from territory near the Mississippi and its tributaries. If this route cannot compete more successfully than it has during the past season, with rail rates at 30 cents and lake and canal rates as high as they have been (and lake rates, at least, higher than they are likely to be hereafter), its effect upon grain transportation will not be great, for it will not make the rates as low as they have been for years previous to last winter.

The American Society of Mechanical Engineers.

The first annual meeting of this Society has just been held, and some comment on it seems to be in order. A great deal that is favorable for its future prospects was apparent at this first meeting, but some other things could be observed which were not so auspicious. It should be said, though, that this first meeting ought to be regarded with a liberal amount of allowance, because, as a mechanic would say, the machinery has not yet worked down to its bearings.

The attendance was as large as could have been expected, although the weather was execrable. The room for holding the meeting—the theatre of the Union League Club—is an excellent one for the purpose. The character of the room is always an important element in the success of such meetings. Some

very excellent papers were read, and others, we regret to say, were quite unsuited for the use that was made of them, and others still unworthy of the distinction of being read at all. This, no doubt, was largely due to the fact that the organization of the Society has been incomplete and that a wholesome supervision was not exercised over the effusions of some of the immature members.

It falls to the lot of the editor of a technical paper to be obliged to listen to the proceedings of most of the societies in which his readers are interested. He has, therefore, a good opportunity of observing the holding capacity of an audience. Authors of papers and speakers in public either do not estimate, or lose sight of, the fact that the power of an audience to give attention to a subject is limited, and, therefore, if they expect to be listened to they must determine how to convey their ideas to their listeners without exhausting their capacity of giving attention. An excellent paper might be written, as we think has been suggested before in these pages, on the "Limit of Elasticity of a Popular Audience." It is very certain that it requires a comparatively small number of mathematical formulae to stretch the attention of listeners beyond its elastic limit. The reading of a mere compilation seems to produce a sort of torsional strain on the hearers, as any one may observe by noticing how they twist about in their seats, and a puff or an advertisement of something in which the author of a paper has a pecuniary interest has a corrosive effect which destroys silently the confidence of those who are expected to believe what they hear.

The majority of the papers, though, which were read were very good, and the discussions thereon were extremely interesting, although there were evidences at times that the latter were suppressed by the feeling that there was not time enough. This was owing to the fact that it was first supposed that the room could only be occupied until Friday evening. Fortunately this was not the case, and the meetings were not interrupted.

It would, of course, be easy to write a great deal that would be very favorable for the future prospects of the new Society, but perhaps it will be much more salutary to point out some of the dangers which made themselves apparent, and to which it is especially exposed.

One of these is the admission of too large a number of inexperienced members, of a low order of ability and with assurance inversely proportionate thereto; the second is that the Society may be used as an advertising medium for inventions, machines and merchandise; the third, that it will be congested with papers which are largely compilations, exercises in mathematical dexterity, or fatuous utterances of immature beginners in the art of mechanical engineering.

Most men who have reached middle age will not submit to listen to that which is neither entertaining nor profitable, and as soon as these characteristics predominate in the proceedings of the Society of Mechanical Engineers they will silently stay away from the meetings. It therefore seems important that some sort of supervision should be exercised over the papers which are admitted to be read, and that some factor of safety governing their length and character should be established which will be well within the limit of elasticity of the audience.

The future prospects and many of the features of this first meeting have been too auspicious and even brilliant to admit of the Society being founded by a flood of dullness, especially when it is the means of bringing out papers so valuable and interesting as those of Mr. Sellers, Mr. Holley, Mr. Hoadley and others. What is needed is an intellectual weir of some kind which will retain the big fish and let the small fry through.

Foreign Railroad Notes.

A committee of the French Parliament, after a long investigation of the complaints against the manner of conducting railroad business in France, brought in a report last spring (only recently published) which closes with the following recommendations:

1. Improvement of the accommodations for passengers, especially those for third-class passengers.
2. Revision of the rates for express packages and valuables.
3. Uniform classification of freights for all French roads.
4. Establishment of a regular tariff with uniform rates per mile for the whole country; division of this tariff into different classes, the two highest of which shall bear equal rates per mile for all distances, while the rates per mile for the lower classes shall decrease with the distance carried.
5. Reduction of the regular rates for delivery of full carloads.
6. Acceptance of the principle of the shortest route, without distinction of the companies to whom the road or roads forming it may belong, in calculating distances.

7. Revision by the government of the special tariffs now in force. Reduction of the number of them. [About four-fifths of the freight in France is carried at special rates.]

8. Abolition of the rule that to get the benefit of a special rate the shipper must designate the tariff by which the freight shall be sent.

9. Adoption in the way-bill or receipt of a rule by which the shipper shall be entitled, in case the time for delivery is exceeded, to withhold part of the freight money.

A recent investigation in France has shown that the railroads there, which altogether publish their freight tariffs quarterly in two great volumes, had the following special tariffs: 1,063 special local tariffs, 456 special tariffs over more than one road, 33 export tariffs, and 302 special international tariffs.

In Prussia district "railroad councils" have been established, consisting of members of chambers of commerce and other representatives of shippers' interests. These are to confer with the government railroad directories that have charge of the operation of the government railroads, and advise them as to what the public would like to have done. Such a body will be likely to represent enlightened public opinion authoritatively, as those who have any fault to find with the railroads will be likely to go to these councils, whom the railroad officers must hear. A national railroad council with similar duties is to be established.

The obituary notice of the Chairman of one of the Prussian government railroad "directions" (having the charge, usually, of about a thousand miles of railroad), enables us to trace the career of a leading railroad man in that country (his position being about equivalent to that of a general manager in this country, as his only superior officer was the Minister of Public Works). The deceased, Privy Government Councillor Jecklin, of an influential and well-to-do family of Cassel, was educated to the law. For several years he served in the official position of "Assessor" of a magistracy in a little town in Hesse, and afterward as Supreme Court Assessor in Fulda. In 1860 the Electoral government of Hesse appointed him member of a directory which had charge of the construction of a railroad in that little country, his duty being to secure the right of way. On the annexation of Hesse, Jecklin entered the Prussian civil service, remaining in his previous position as a member of the Cassel railroad direction. In 1871 he was called to Berlin as member of the direction of the Lower Silesian & Märk Railroad, probably the most important coal road in Germany, and one of the most important of all German roads for freight traffic. Here he served in an office about equivalent to that of Treasurer. In 1873 he was promoted to be Chairman of the Royal Railroad Direction at Saarbrück, from which place he was transferred to Stettin early this year. His training was thus chiefly administrative, and very little technical. At Saarbrück he is said to have had to meet great competition from other roads, and to have distinguished himself by his success in filling a particularly difficult position. The qualities ascribed to him are an amiable and attractive disposition, great practical acuteness, skill in conducting negotiations and in compromising conflicting interests, quickness of conception, certainty in decision, great skill in expression in writing, and astonishing rapidity in disposing of work. It must be remembered that he was trained wholly in the government service, and never served a railroad corporation. Neither was he what could properly be called an eminent man of his class, being only a favorable specimen of the dozen or so men in Prussia who have reached the highest positions in the state railroad service.

Dr. J. Rigler, of Berlin, who has made a special study of the affections to which railroad employés are especially liable, has recently published a pamphlet on the subject. He based his study on the personal records kept for 30 years on the Berlin, Potsdam & Magdeburg Railroad of its employés, which give the term of service and condition of health of each of its employés. Dr. Rigler's conclusions are:

1. That among the different branches of railroad service only service on the locomotive has in a special manner an effect on those employed on it, and produces in them morbid changes of the whole nervous system, which either are manifested early when circumstances favor, or, as is commonly the case, incapacitate the victim for labor after 20 or 25 years' service.
2. That the engine-men and train-men, but especially the former, beside the injurious effects of their calling upon their nervous systems, are further exposed to a series of injuries in the service which predisposes them to rheumatic and catarrhal complaints.
3. That the power of the organism to withstand the harmful effects of the service decreases in inverse proportion to the increasing years of service.
4. That the general condition of health, especially of those engaged in the engine service, has deteriorated in a very striking manner within the last 15 or 20 years; that recently diseases of the lungs have been much commoner and rheumatisms much more severe among engineers than was formerly the case.

This latter phenomenon Dr. Rigler ascribes to the inclosing of the foot board, which has been gradually introduced in Germany within the time named. In this way the men are not only more exposed to the heat, but also to the effects of the gases of combustion, the fine flying ashes, and to the coal dust; and further, they are liable to be cooled off on one side by frequently bending the body outside of the inclosure in order to get a clear view of the track. The doctor recommends that the roof of the cab be shortened, and provision be made for keeping the front window clean without opening it, and measures taken to reduce the severe shocks to which a person standing on the engine is exposed. In answer to the most important question, how to avoid the "irri-

tation of the nervous centres," which exists among engine-men almost without exception, the doctor recommends, as most effective in postponing the time when service will be impossible, rest, periodical vacations and bathing.

The hanging of our locomotives on springs and equalizing bars makes them very much easier to ride on than European locomotives, and the evil effects on the nervous systems of engine-men are probably much less here than in Europe, though careful investigation would probably show that they exist here too. The men who distribute letters in postal cars here are said to be worn out after a comparatively short term of service.

The investigation of the Railroad Science Society, of Berlin, on the applicability of the American baggage-checking system in Germany, brought out the fact that at the Berlin & Dresden station in Berlin, within the eleven months ending last May, 8,478 baggage receipts were given out in local traffic, on 5,002 of which there were charges for extra weight, and in through traffic 2,120 baggage receipts were issued, 837 of which contained charges for over weight. Taking the whole traffic of the road, it received for carrying baggage an average of 20 cents per ticket and 15 cents per piece of baggage in the local traffic, and in through traffic (in connection with other roads) an average of 25 cents per ticket and 20 cents per piece of baggage. Taking the baggage which paid charges by itself, the average charge was 34 cents per ticket and 23½ cents per piece of baggage in the local traffic, and 55 cents per ticket and 45 cents per piece of baggage in the through traffic. At the Berlin, Potsdam & Magdeburg Berlin station in six months the receipts for extra baggage amounted to \$3,890, and to 34 cents per piece of baggage. On the Berlin & Hamburg road there were no charges on about two-thirds of the baggage. In the year 1879 about 6,000 tons of baggage were carried and \$25,600 received for extra baggage. It had been proposed that the limit be placed at 110 instead of 55 lbs., and a uniform change be made for all weights below 100 lbs. If this had been done, the road would have required about 28 cents per piece of baggage to make up for its losses on extra baggage. The Berlin & Gorlitz road has collected from extra weight an average of 12 cents per piece for all baggage.

In the course of the discussion it was said that the American system was largely the result of the high charge for carriages in this country, which has occasioned the establishment of express companies for carrying baggage to and from stations. In Europe the traveler pays but a small sum for having himself and his trunk carried together by a cab, and the certainty of having his trunk as soon as he arrives compensates for some inconveniences. The feeling was that the roads could not do without their receipts for extra baggage, and that without increasing the weight of free baggage enough to include nearly all the baggage, the check system would not be of much advantage. The receipts of the Prussian railroads for extra baggage in 1878 amounted to more than a million dollars. Dr. Wedding was thanked for bringing up the subject, but it was voted not to urge the matter further.

The bad season in the Russian governments of Simbirsk, Samara and Saratov this year have made it necessary to import hay there, which is collected in great quantities in the governments of Orenburg and Ufa. In Orenburg a number of merchants bought hay presses in order to provide for shipping to supply the unusual demand. But when they came to the railroad to get cars for their bales of hay, the local management was at a loss what to do, and, after correspondence with the general offices in St. Petersburg, announced to the would-be shippers that the acceptance of pressed hay for shipment was wholly forbidden, on account of danger from fire! This road has so little business that the Russian government has to pay yearly a considerable part of its working expenses, which exceeds its receipts.

A Russian has succeeded in running a street car by electricity, but it went slower than if horses had drawn it, and at very much greater cost.

In Europe, formerly, the railroad curve was made circular, and the elevation of the outer rail was either made wholly in the tangent or half in the tangent and half in the curve. Now, however, what is known as "Nördling's cubical parabolic curve," whose radius decreases in proportion as the elevation increases, is generally introduced between the tangent and the circular curve. In this at the point of curve the radius is infinity and decreases to the radius of the circular curve, where it connects with that curve, at which point the maximum elevation is attained. Recent experiments in Germany are said to have shown that trains enter the curves more gently when the outer rail is made to attain half its elevation before reaching the beginning of the parabolic curve.

It is proposed to have a great international railroad exhibition in Berlin in 1882 or 1883, for the display of every thing connected with railroads and their development. A similar exhibition was proposed in Vienna some months ago.

Some ten years ago the Hungarian railroads, which are largely engaged in carrying grain destined for export, competed sharply with each other and made very poor returns. Then agreements were made by the companies by which the traffic was divided among the different roads, as by our pooling system, and a whole system of rebates was suddenly abolished and rates generally advanced, so much so that the cost of exporting a car-load of grain or flour was increased by \$65. On exports to North Germany the advance amounted to 12 to 30 per cent.; on shipments from the vicinity of the Theiss to Buda-Pesth the advance was 22 per cent., and from certain junction stations of the Hungarian State Railroad to Buda-Pesth it was as much as 100 per cent. Moreover, the lowest rates of the new tariff were ap-

plied only to shipments of full car-loads of 22,000 lbs., while those of the old one were applied to all quantities. This entirely broke off the purchase of small dealers and bakers in Austria, Bohemia and Moravia from Hungarian millers, compelling them to resort to large dealers who could order by the car-load. A Hungarian writer commenting on this says: "It did not require a long time to convince the railroads that even when they apportioned the traffic among themselves they could not advance their rates at pleasure without injurious results. For the competition of the world makes itself felt, and this they cannot remove, and it requires that the rates be made as low as possible." In 1879 there was a general revision of the grain rates, making them lower, but more uniform than before the days of apportionment. Some of the rates per ton per mile after the revision are given as follows: Royal Hungarian State Railroad, 2.322 cents; Southern Railroad, 2.407; Theiss Railroad, 2.516; Austrian State Railroad, 2.528; Western Railroad, 2.549; Alfeld Railroad, 2.757; Hungary & Galicia, 2.847; Kaschau & Oderberg, 3.017. These are considered very satisfactory rates, though they greatly exceed any except for very short distances in this country. The lowest would amount to 32½ cents per 100 lbs. from Kansas City to St. Louis, to 57 cents from Kansas City (or Omaha) to Chicago, and to \$1.11 from Chicago to New York. The Hungarian rates, however, are not applied uniformly for all distances, but are lower for the greater distances. For instance, the tariff of the Austrian State Railroad (which, by the way, has not been a government road for many years) is 0.4 kreutzer (0.5 cent) per 100 kilogrammes (220 lbs.) per kilometer (0.6214 mile) for the first 70 kilometers, and 0.26 kreutzer for every additional kilometer. This is at the rate of 2.84 cents per ton per mile for 43 miles, and only 1.83 cents thereafter, which for a shipment from Kansas City to St. Louis would be only 27½ cents per 100 lbs.; to Chicago, 47 cents; and from Chicago to New York 90 cents per 100 lbs.; the latter just three times the rate that has been charged for seven months.

Record of New Railroad Construction.

This number of the Railroad Gazette contains information of the laying of track on new railroads as follows:

Burlington, Cedar Rapids & Northern.—The Pacific Division is extended northwest to Clarion, Ia., 43 miles.

St. Louis & San Francisco.—The Arkansas Division is extended south to Seligman, Mo., 5 miles.

Indianapolis, Delphi & Chicago.—Track laid from Rensselaer, Ind., north 8 miles, and from Dyer, Ind., south 8 miles.

Bell's Gap.—Extended from Lloydsville, Pa., northwest to Coalport, 12 miles. Gauge, 3 feet.

Oregon Railway & Navigation.—On the Columbia River Line, between Dallas, Or., and Wallula, Wash. Ter., 67 miles of track have been laid.

Ohio & West Virginia.—Extended from Gallipolis, O., northeast to Middleport, 17 miles.

Chicago & Northwestern.—The Toledo & Northwestern line is extended from Gifford, Ia., west and northwest to Webster City, 42 miles. The Menominee River line is extended from Quinnesec, Mich., west to Florence, 17 miles.

Dallas & Wichita.—Extended from Lewisville, Tex., west to Hickory Creek, 5 miles.

Burlington & Missouri River in Nebraska.—The Republican Valley line is extended from Harbine, Neb., east to Chester, 4 miles.

Connotton Northern.—Track laid from Canton, O., north to Hartsville, 12 miles. Gauge, 3 feet.

Chicago, Milwaukee & St. Paul.—The Iowa & Dakota Division is extended from Mitchell, Dak., west 20 miles.

Atholton, Topeka & Santa Fe.—Extended from San Marcial, N. M., south 25 miles.

Southern Pacific.—Extended from Lordsburg, N. M., eastward 15 miles.

Vernon, Greensburg & Rushville.—extended from Westport, Ind., south to Brewersville, 7 miles.

St. Paul & Duluth.—The Taylors' Falls & Lake Superior Branch is extended from Centre City, Minn., northwest to Taylors' Falls, 10 miles.

Denver & Rio Grande.—Track is laid on the Gunnison Extension from Salida, Col., west 3 miles; also on the Eagle River line from Malta, Col., west 12 miles. Gauge, 3 feet.

This is a total of 332 miles of new railroad, making 4,946 miles thus far this year, against 2,987 miles reported at the same time in 1879, 1,777 miles in 1878, 1,867 miles in 1877, 1,931 miles in 1876, 1,128 miles in 1875, 1,594 miles in 1874, 3,288 miles in 1873 and 5,982 miles in 1872.

NEW YORK CENTRAL EARNINGS IN OCTOBER, which is the first month of the fiscal year, are reported as follows:

	1880.	1879.	1878.
Passengers.....	\$741,739.07	\$646,783.77	\$653,604.91
Freight.....	2,001,569.89	1,974,113.10	1,723,515.60
Miscellaneous.....	351,889.39	277,089.32	304,023.10
Total.....	\$3,095,198.35	\$2,898,586.19	\$2,771,203.61

Compared with last year there is an increase of 14.7 per cent. in passenger, 1.4 in freight, 26.7 in miscellaneous and 6.8 per cent. in total earnings; and the total 1879 earnings were 4.6 per cent. more than in 1878. The increase in freight earnings over last year is very small.

Compared with previous months, the October earnings this year are the largest recorded for the 25 months for which monthly reports have been made, but they are very little larger than in August last. The passenger earnings are smaller than in September, but larger than in any other month; the freight earnings are 13 per cent. greater than in September, but are a little less than in March last.

The very considerable increase in freight earnings over September must be due to a larger traffic, as rates were

lower on an average this year. East-bound through traffic was much heavier in the last third of the month, but not much in the first 20 days or so. In 1879, and suppose we may say usually, freight earnings were larger in October than in September, but then only 9 per cent., while the gain this year has been 13 per cent.

The prospect now is for a larger east-bound through freight traffic in November than in October, at a rate a seventh lower for one-third of the month and a fourth lower for the rest of it on grain and flour. Last year, in spite of the advance in east-bound through rates, the freight earnings were less in November than in October. In November, however, the west-bound movement is always lighter. It must be remembered that to make as large earnings as last year a much larger traffic will be required this year in November.

EAST-BOUND RATES will now probably not be advanced until the close, or very near the close, of lake navigation. The roads are all very busy, and some of them are very anxious to have an advance as soon as possible; but others intimate that it will be best first to restore rates at certain places (notably Peoria and Indianapolis) where some lines are carrying at less than the regular rates, and it is probable that this will have prevented, for as much as three weeks, an advance of 5 cents per 100 lbs.—certainly a very high price to pay for an irregularity of this kind, but paid alike by those who are and those who are not responsible for it. The earliest day at which it will be possible to advance rates now will be Nov. 21, and at that time, though shipments will be made for nine days probably from lake ports to Buffalo, as well as from Buffalo to New York; the canal shipments will hardly get through to New York and the lake shipments will have to be forwarded by rail from Buffalo or stored there. Indeed, lake shipments made after this date will not get through by canal, so that its competition will not be met on anything forwarded from Lake Michigan ports hereafter. Indeed, its competition can hardly be said to be felt now, as canal rates for a week have been nearly the same as rail rates from Buffalo. The total water rate from Chicago to New York, too, has been substantially the same as the rail rate for this time, and it is more likely that the rail rates are keeping down the water rates, than that water rates are keeping down the rail rates, the more so as water rates are unusually low for this time of year.

WATER RATES have remained pretty steady during the past week, without any advance on the lakes and canal, such as is usual so soon before the close of navigation. In deed, lake rates have fallen off a little since Monday. Until then they stood about as they closed on Wednesday of last week, namely, at 7 cents for corn and 7½¢ for wheat from Chicago to Buffalo. But Wednesday the quotations were 6½¢ to 6¾¢ for corn. The fact that there is a blockade in Buffalo harbor, the elevators being unable to discharge the vessels when they arrive, makes it of little advantage to ship by lake. The canal rates remain unchanged at 9 cents for wheat and 8 for corn from Buffalo to New York—the former the same and the latter only half a cent less than the rail rate. The boatmen complain that this rate is not enough, and that there would be no blockade at the elevators if it were as high as it ought to be, which they think to be about 10 cents for corn and 12 for wheat, but with the rail rates 9 and 8½¢ this could hardly be managed. As it is, it seems that the railroads are pretty sure to get pretty much all the grain that arrives at Buffalo after this date, as the vessels are liable to be delayed some days before they can be unloaded, and in a few days it will be too late for the boats to get through.

Ocean rates have remained during the week at the advanced rates which they reached Wednesday of last week, not going below 7d. nor above 7½d. per bushel for grain by steam from New York to Liverpool.

THE PETROLEUM EXPORTS continue to be light, and rather tend to become lighter. While for the ten months ending with October they were 13.6 per cent. less than last year, for October they were 39 per cent. less. New York, however, has lost comparatively little, while in percentage of the total exports it has gained greatly, and, moreover, has lately gained faster than ever. For the ten months it has exported 76.2 per cent. of the total, while 71.6 has been its largest percentage heretofore; but for October it exported 95.3 per cent. of the whole, making the business elsewhere (at that time) absolutely insignificant. Its gain has been at the expense of Baltimore and Philadelphia both, but of Philadelphia chiefly, probably because Baltimore has no longer much business to lose. Its petroleum exports were built up with astonishing rapidity by the efforts, chiefly, of the Baltimore & Ohio Railroad, but they have fallen off with almost equal rapidity; having had 15½ per cent. of the whole in 1876, it has fallen to less than 5 per cent. in 1880. Baltimore never affected the New York business much, but chiefly the Philadelphia exports. In 1878 the exports of the two last-named cities for the ten months were almost equal. This year Philadelphia has exported three and a half times as much as Baltimore. It is not easy to understand why exports should fall off so much this year. The price cannot be considered high—about 92 cents, a barrel for crude at the wells, and 12 cents per gallon for refined at the sea-board.

BRITISH WHEAT IMPORTS for the crop-year ending with August, 1880, amounted in flour and wheat, to the equivalent of 138,478,524 bushels, of which no less than 64.5 per cent., or nearly two thirds, came from the United States, while Russia is credited with contributing only 6.5 per cent., on only one-tenth as much as this country, though not many years ago England got more wheat from Russia than from

this country. But Russia last year did not even stand second to the United States, 7.3 per cent. of the supply having come from Canada, (British North America), though about three-fourths of this was grown in the United States. Very likely, however, most of the 4.5 per cent. that is credited to Germany came from Russia; little or none of German production is exported, but shipments from Russia and even from Hungary used to be made in considerable quantities to German ports for export until Prince Bismarck's "reform" in the railroad tariffs sent them to other routes. The quantities from some of the other chief exporters were: Australia, 5,300,000; British India, 4,640,000; Egypt, 4,270,000; Chili, 3,345,000. From no country, except this, have the whole year's wheat imports equalled the total receipts of grain (of all kinds) at our Atlantic ports in a single week last June.

THE WESTERN PASSENGER ASSOCIATION, which began a session at St. Louis last Wednesday, was provided by its Executive Committee with a programme which could be discussed advantageously for weeks; indeed, some of the questions might well be the subjects of a treatise. Most of them are aside from the matters of business which the Association has to transact, but are brought up for the purpose of advancing knowledge in the department, just like the questions discussed by the Master Mechanics' and Master Car-Builders' Associations. If any of the members show a disposition to tackle these questions seriously, we suggest that it might be well to appoint special committees to report on the several subjects; they could take time, collect information and compare opinions, and then be prepared to present the results of investigation and thought, as well as of isolated individual experience. It should be said, however, that frequently in such matters a committee of one is better than a larger one. In such a committee the reporter bears all the responsibility and gets all the credit and is not hampered by having to wait for the motions of other people.

Notes of Travel.

PITTSBURGH.

The first place visited in this city was the establishment of WILSON, WALKER & CO.

This enterprising firm, as most of our readers know, is engaged in the manufacture of a great variety of rolled and forged iron work for railroads. Their production includes merchant bar and plate iron and a great variety of forged iron for various purposes, such as draw-bars and hooks, follower-plates, buffers, equalizing-bars, centre-plates, truck frames, swing-hangers, coupling-pins and links, axles, locomotive frames, etc.

For the manufacture of some of these they use special machinery designed for the purpose, and have employed every means to facilitate the production of this kind of work. Their establishment covers from four to five acres, and is divided into two distinct departments, one the iron mill, where the rolled iron is manufactured, and the other the forge, in which the different articles enumerated are made. In the mill about 300 men are employed and in the forge about 200.

Doubtless among railroad men there are many who, like the writer, have a very imperfect knowledge of the process of conversion of pig-iron into rolled bars and plates. To such, a short description of the process may be of interest.

In the establishment of Wilson, Walker & Co., as in all other rolling mills, the pig-iron is melted in what is called a puddling furnace. When melted in this furnace, a process very similar to ordinary boiling takes place. While this is going on the iron is stirred with an iron bar, or puddled, as it is called. After a short time the melted iron, instead of being perfectly fluid, assumes a sticky, adhesive character, somewhat like snow when it begins to melt. When this occurs the workman is able to form it into a huge ball in the furnace. This ball is incipient wrought iron, as distinguished from cast iron, but mixed with a great deal of impurity, such as slag, cinder, etc. The iron is a spongy mass, in which the impurities may be said to be absorbed, as water is in a sponge. In this condition the metal is called a puddled ball. The next process is to pass it through a rotary squeezer. This is a machine consisting of a vertical revolving cylinder, serrated or fluted on its outside surface. This cylinder is contained in an external case which is eccentric to the cylinder. Consequently the opening on one side is considerably wider than on the other. The ball is inserted in the wide opening, and is made to revolve by the motion of the cylinder, and in this way is forced into the opening between the cylinder and its case. As this opening is widest at its mouth and is contracted toward the other end, the ball is not only revolved but is squared into a space which grows narrower as it advances. In this way most of the impurities are squeezed out, leaving it a comparatively pure mass of iron. It is then run between two horizontal rolls, and is thus formed into a mass approximating to a rectangular form, and is then called a "muck bar." This bar is then cut up into suitable lengths and re-piled, that is, the pieces are made into a pile of suitable size and put into a heating furnace and reheated, and are then rolled into bar or plate iron. This product is refined iron. Double-refined iron is cut up again after this process and re-rolled.

In Messrs. Wilson Walker & Co.'s establishment there are twenty puddling furnaces, besides reheating furnaces, a set of muck rolls for making muck bar, a set of guide rolls for making round iron up to 1½ in. diameter, a set of bar rolls for round iron up to 5 in. diameter, a set of plate rolls for plates 24 in. wide up to 1½ in. thick, and a small universal mill for rolling flat bars from 1 in. up to 6 in. In this mill the raw material is made which is supplied to the forge and

then converted into the shape required for use on railroads.

Most railroad men have an idea of the consumption of coupling pins and links on railroads. It is said by the manufacturers of ordinary pins, used chiefly by the other sex for fastening their dresses and articles of personal adornment, that the consumption averages one per day for each man, woman and child in the country. Possibly statistics might reveal some similar approximate law for the consumption of coupling links and pins on railroads. Be that as it may, the consumption is undoubtedly very large, and to supply the demand for these articles Messrs. Wilson, Walker & Co. have constructed special tools and machinery for manufacturing them, and are now producing them in enormous quantities.

For making links they have a machine which takes the iron direct from the rolls, cuts it into suitable lengths, bends it into the form of a link and bevels or "scarfs" the ends so as to prepare them for welding. A description of the machine without an engraving would be quite unintelligible and useless. It will, however, cut and bend about 15 tons of iron in 12 hours. As a coupling link weighs from 6 to 8 lbs., this quantity of iron would make about 5,000 links in the time named. After leaving the machine, the ends of the bar forming the link are welded under a 300-lb. steam hammer. This has two dies—one attached to the hammer-head and the other to the anvil—which are of the form of the end of the link. When the latter is heated, it is laid in the die on the anvil, and a few blows of the hammer are sufficient to complete it, the whole time required being only about one-quarter of a minute for each link.

In the manufacture of coupling-pins, special tools and machines are also provided. In making these the bar iron is cut of such a length that it will make two pins. These bars are then heated in a special furnace for the purpose, and the two heads are forged in the bar, one at each end, under a 1,000 lb. steam hammer, which also has suitable dies in the hammer head and in the anvil for forming the head. After this is done, the links are pointed in the centre of the bar, which is also done with dies. This process cuts the latter nearly in two, so that a slight blow separates and completes them both. The time required to make two pins in this way, taken with a watch, was 2¼ minutes. The product of this process of manufacture is much better finished and more uniform in appearance than it is possible to produce by hand.

Another very effective labor-saving machine is one for bending what are called arch-bars for iron truck frames. Ordinarily, these are bent on a cast-iron "former" by hand. In the machine referred to, there are two such formers, which are counterparts of each other. One of these is stationary, and the other is moved by suitable mechanism. The heated bar is placed between the two, and in a shorter time than is required to write this description, the movable former presses the bar into the shape required.

This machine will bend 18 tons of iron in 12 hours. After the bars are bent they are drilled on a multiple drilling machine, which insures the accuracy of the work and makes it perfectly interchangeable.

The heads of swing-hangers are forged in dies in very much the same way as coupling-links are made. A flat bar of sufficiently large section to make the head is cut of the proper length, and a head is formed on each end, and the bar is then drawn down between the two to its proper size.

In the manufacture of the various complicated forms of wrought-iron draw-bars this firm has shown much ingenuity. It would be impossible though, without engravings of the different "shapes" into which the iron is formed in the process of manufacture, to give a clear idea of the way in which it is done. By examining some of these draw-bars, or even the illustrations in their catalogue, most mechanics will be puzzled to know how they are forged, and a great deal of skill has been shown in devising means of doing this kind of work. Some of their processes Messrs. Wilson, Walker & Co., not unnaturally, prefer should not be made public.

In their forge they have one 4-ton steam hammer to make billets, ten other steam hammers of various sizes, and two helve hammers for making axles and other similar work. There are five heating furnaces for steam hammer work, and 28 fires for hand work.

It was gratifying to learn from this firm that the demand for the master car-builders' standard axle is rapidly increasing, a fact which was afterward confirmed by interviews with other railroad men farther west. Probably a majority of the Western railroads have now adopted this axle for all new cars they are building or have ordered, and intercourse with car and axle manufacturers has confirmed this. One Western car manufacturer said that now they rarely had orders for cars with any other axles. The long struggle for their general introduction is therefore likely to accomplish its purpose, and if the journal-bearing and journal-box are only reduced to some reliable standard, uniformity of these parts is quite certain to be attained, if not universally, at least to a very great extent.

One of the results predicted has already resulted. It was said years ago that if only a standard axle were generally introduced, it would become a staple article of merchandise which manufacturers would produce in dull times and keep on hand with a certainty that there would be a demand for them. In this way the prices would be reduced, because manufacturers would then run their establishments on them in dull times, whereas if there were no standard, they could not feel sure of selling any special form of axle unless it was ordered. Messrs. Wilson, Walker & Co. say that they now keep a supply of standard axles on hand, and can nearly always fill an order for a few hundred as soon as the order is received. They are now making two qualities of axles, the one

made from scrap iron carefully bloomed, and the other from a fine quality of double-rolled fibrous bar iron. For the heavy cars now coming into such general use it would seem to be true economy to use the best quality.

Besides the safety which results therefrom, it has also been shown that the friction of a journal is affected by the quality of the metal of which it is made as well as by that of the bearing, and that the heating of both is often due to poor iron as well as to bad brass.

The general tendency in the mechanical engineering of railroads is to supersede cast iron with wrought iron, and in this country the forging of complicated forms has not been carried nearly so far as it has in Europe. Probably the firm which has done most to introduce forgings in place of castings on our railroads is the one whose works have been described.

WESTINGHOUSE BRAKE COMPANY.

The shops of this company are filled to overflowing with orders. Mr. Westinghouse has recently been perfecting a coupling for the brake-hose of his system. The new coupling, it is thought, will obviate the difficulty which occurs at times by the opening or closing of the cock in the brake-pipe under the cars, and which has been a source of some trouble.

He is also engaged in perfecting the apparatus for lighting cars which he devised some time ago. It is now in regular use on a car running in local trains on the Pennsylvania Railroad out of Pittsburgh. The light is certainly all that could be desired. With four lamps, the car is illuminated so that persons can see to read in any part of it, and the quality and color of the light could hardly be improved. Each lamp has a maximum efficiency of 35 candle-power and, as ordinarily worked, of about 25 candle-power.

The light is produced from compressed air, which is carburetted by passing it over or through gasoline or some of the other light products of petroleum. The air is compressed by the pump used for the Westinghouse brake. A separate tank is provided for illuminating purposes for each car. This tank is filled with compressed air by the pump, but has a check valve attached to it, so that when the brakes are applied the air in the illuminating tank does not escape. The carburettor consists of a rectangular sheet-iron vessel, placed under one of the end seats in the car. The one used is 11 x 14 x 31 in. This is filled with mineral wool, ordinary bricks or fire-bricks, or any other substance which will absorb the gasoline or carburetted liquid readily. The tank is first filled with the liquid, until the absorbent has taken up as much as it will hold, and what remains is then drawn off. The air reservoir is connected with the bottom of the carburettor by a pipe which has a reducing valve between the two, so that the air enters the carburettor with a pressure equivalent to about one inch of water, and is maintained uniformly at that pressure. By this arrangement the air passes through the absorbing material and passes out at the top of the vessel. In doing so it takes up a sufficient quantity of the gasoline to make it a good illuminating gas. From the carburettor this is conducted to the burners and is used in the ordinary way. Its success so far has been excellent, and it only needs to be perfected in its details to come into general use. From the way in which the car is illuminated it might safely be inferred that this light will soon be ready to emerge from the experimental into a practical stage.

PITTSBURGH, FT. WAYNE & CHICAGO RAILROAD SHOPS.

In these works, as in all others of the same kind, at present, there is plenty to be done. It happens usually, though, that the more work there is the less a visitor finds to comment on. There is not very much to be said about the fact that a master car-builder has an order, and is busy in making a hundred or a thousand cars, all exactly alike, or that the master mechanic is devoting all the force in the shop to keeping the locomotives in good condition. In fact, the impression left on the writer at the end of his journey was, that railroad managers never manifested so little interest in improvements of their equipment. Nearly every superintendent has more business than he can attend to, and his concern is not to get improved and better cars or engines, but to get any kind to supply the demand which the enormous business of this year requires. At the Fort Wayne shops this condition of things prevails. A new oil house which has been built since the writer visited Pittsburgh last is of somewhat novel construction, but a description without engravings would give a very imperfect idea of its design. It is perfectly fire-proof, and is arranged so as to make the distribution and the accounting for oil as convenient as possible.

The passenger engines used on the Eastern Division of the road, and which are said to work very satisfactorily, have been built in these shops. They have 17 x 24 in. cylinders, driving-wheels 5 ft. 2 in. in diameter, grate 6 ft. long x 35 in. wide. The Allen valve is used with 5½ in. throw and 1 in. lap, steam-ports 15 x by 1¼ in., boiler 52 in. in diameter with 162 2-in. tubes 11 ft. 1 in. long. The weight of the engine is 80,000 lbs.

The London Engineer has recently been publishing a number of articles which are intended as a sort of general denial or refutation of the claims made for the superiority of American locomotives over those made in Europe. Some very foolish things have undoubtedly been said and written about the superiority of our locomotives. There is no occasion at present to defend or to deny.

The following fact, though, will be of interest and may shed some light on the question whether American locomotives are easier to keep in repair than those of English design:

On the Eastern Division of the Fort Wayne road there are

155 locomotives, of which, on the 15th of October, nine were in the shop for repair. Of these nine three are or were old engines which have been broken up, and new ones are being built to take their place. On the Western Division there are 127 engines, of which eight are in the shop for repair. On the Cleveland & Pittsburgh Railroad there are 97 engines, of which six are in for repair. On the Erie & Pittsburgh Railroad there are 29, and one in for repair. There are thus 408 engines on these lines, of which 24, or less than 6 per cent., are in the shops for repairs. If the three new engines are not included, there would be only a little over 5 per cent. of the engines laid up for repairs. It must be remembered that this is at a time too when the road is crowded with such a traffic as it has never had before, and which has been growing rapidly for the last four or five years. The statement is given without any knowledge of how it will compare with the practice in Europe. If English locomotive superintendents can do better than this, that is, keep a larger number of locomotives in service, *The Engineer* may be assured that Americans will "want to know" how they do it. It is, of course, sheer nonsense to say that with the unsurpassed facilities in tools, workmen and material to be found in England they are not able to do as good work there as we do here, but one of the claims made for American engines is that they can be kept in repair with less labor and expense than English engines can be. Considering how unlike they are in their design, it would not be remarkable if there should be a difference in their wear and working, and in the facility with which they can be kept in order.

The Passenger War at Chicago.

The Southwestern railway lines are again applying the knife to each other's throat, in a figurative sense: not too figuratively, but just figuratively enough. The peace which was loudly proclaimed less than a fortnight ago proves to have been only an intermission of hostile action, pending the attempts at the formation of a pool. The truce has suddenly ended and hostilities are resumed. Some account of the armistice and how it came to be broken, will be timely in this connection.

After the war between the Alton, Wabash, Burlington Rock Island and Illinois Central had progressed for a week or more, and the contestants had stocked the local markets of the West with their issues of unlimited tickets, the presidents of the several lines met with Jay Gould in New York and ordered a cessation of hostilities. They proclaimed that they had agreed to an arrangement for pooling the passenger traffic between Chicago and Toledo on the east and southwestern points on the Missouri River. The managers were ordered to restore rates and arrange the details of the pool. The rates were restored, and an attempt made by the managers to organize the pool conformably to the basis agreed upon by the presidents. They imposed the work of fixing up the details upon their general passenger and ticket agents, who, however, have made but little headway, failing to agree upon many important questions, which were finally referred back to the managers for settlement. The managers, however, owing to successive postponements, have not come together, and consequently only the most trifling progress has been made toward the formation of a pool. It is now officially announced that the meeting will positively occur on Monday.

In the meantime the presidents fell into disputes among themselves as to the provisions of the agreement which they had so hurriedly adopted in New York. Their constructions of the compact were totally at variance with each other. Jay Gould and President Humphreys insisted that the Chicago & Alton had assented to the proposition to allow the Wabash one-third of the passenger traffic between Chicago and St. Louis. President Blackstone, of the Alton, denied having agreed to any such allotment. Then the Burlington and Rock Island understood the agreement to be that the Wabash, after ascertaining the exact number of its unlimited Chicago and Omaha tickets upon the market, should deduct the bridge toll on each and put the balance into the Iowa pool, thus sacrificing that business after payment of actual expenses. President Humphreys and Jay Gould did not so understand the agreement, claiming that they had consented to that proposition upon the condition that the Wabash should be allowed to charge one dollar less than the other roads, and also that its Toledo business should not be included in the pool, but that the proviso had been rejected by the other lines.

On Friday, President Riddle, of the Rock Island road, telegraphed President Humphreys, of the Wabash, that the agreement entered into at New York had not been adhered to by President Blackstone, and that therefore the Rock Island Company would not be bound by said agreement from that date. Then both President Humphreys and Jay Gould sent rather savage messages to President Blackstone charging upon him the sole responsibility for any trouble that might ensue. President Blackstone is reported to have replied in kind. At the same time President Humphreys telegraphed John C. Gault, of the Wabash, that the agreement made in New York was "off," and instructing him at once to restore the one dollar "differential" contended for before the truce.

Meanwhile the Hannibal & St. Joseph Railroad Company, learning that the Chicago & Alton and the Wabash were selling rebate local fares between Chicago and St. Louis and St. Louis and Kansas City at rates which aggregated less than tariff between Chicago and Kansas City direct, and thinking it was being cheated in some way or other, commenced a rebate nine-dollar ticket from Kansas City to Chicago. Then on Friday the Rock Island Company cut the rate between Chicago and Kansas City both ways, from \$14.80, which was tariff, to ten dollars, the tickets being limited and sold with a rebate. On Saturday morning, bright and early, the Wabash opened up shop with an eight-dollar rate, limited to Kansas City, Council Bluffs, and St. Joseph; a three-dollar rate to St. Louis, and a corresponding rate to Jacksonville, Hannibal, Keokuk, Springfield, Chenoa, Washington, Pontiac, Bushnell, Canton, Mason City, and Lincoln. The Chicago & Alton opened up for the day with a nine-dollar rate to Kansas City, St. Joseph and Omaha; a four-dollar rate to St. Louis, and a corresponding schedule to other points. The Wabash, in addition to its contention for the one-dollar "differential," carried the fight, it will be observed, to all the principal points common between itself and the Alton and Burlington roads. The sale of tickets at the various offices was stimulated a little by the reductions, but the reopening of the "war" failed to create any excitement, in fact, it fell very flat so far as the public was concerned.

The Chicago, Burlington & Quincy took high moral ground, its officers announcing their intention to adhere strictly to

tariff rates until after the meeting of the managers on Monday, and to carry out in good faith the spirit and intent of the covenant ratified by the presidents in New York. The agents of the company, here and elsewhere, were accordingly instructed to continue selling at the rates heretofore in effect, and not to be influenced by the competitive warfare waged about them by rivals. The course taken by the company will be commended as very sensible.—*Chicago Times*, Nov. 7.

The general course of the war during the past week has been as follows: The rates between Chicago and St. Louis and between St. Louis and Kansas City had been kept down to \$5, chiefly because of the large number of outstanding limited tickets that had been sold for this amount. Then the direct lines between Chicago and Kansas City, by which the regular rate is \$14.80, found their business affected by the ability of travelers to make the journey on two \$5 tickets, and some of them reduced their rate to \$10. Tuesday there was an adjourned meeting in Chicago of the general managers and passenger agents, called to perfect the pools and provide for carrying out the New York agreement; but at this meeting the differences in the understanding of the agreement became so great and decided that nothing could be done, and it was voted to refer the whole subject to another meeting of the presidents, to be held in New York immediately. At that meeting a telegram was read from Solomon Humphreys, President of the Wabash, reasserting that at the New York meeting President Blackstone, of the Chicago & Alton, agreed that the Wabash should have a one-third interest in a Chicago-St. Louis pool, and Mr. Blackstone repeated his denial of any such agreement. The following telegram from Jay Gould was also read at this meeting:

"Mr. Humphreys has read to me all the correspondence, letters and telegrams that have passed between himself and Mr. Midgley and Mr. Blackstone, and I fully concur and approve of every word he has said. The agreement he alleges he made with Mr. Blackstone for the division of the business between St. Louis and Chicago he did make, and Mr. Blackstone subsequently reported the agreement to some of his directors in this city. He not only made it, but its terms are fair. The Wabash line between Chicago and St. Louis is, as I understand it, the shortest of all the lines. They will not take less than the one-third given to them by the New York agreement. I make this statement in justice to Mr. Humphreys and to place the responsibility for a disastrous railroad war where it belongs. You may read this at the meeting to-day."

The same day (Tuesday) the Chicago & Alton announced a rate of \$1 by its road and the Lake Erie & Western from St. Louis to all points where the latter crosses the Wabash, and to its eastern terminus at Fremont, and rates to other points on the Wabash and to Eastern points made up of this \$1 rate plus the rate on the connecting road or roads, making \$2.80 to Fort Wayne, \$3.45 to Cleveland, \$8.90 to Pittsburgh, etc. From St. Louis to Fremont is 510 miles, and half of the dollar received for the journey goes for the St. Louis bridge toll.

The following telegram, received from Chicago Wednesday night, gives for the first time a semi-official report of the proceedings of the presidents' meeting in New York and the Chicago meetings so far as they concern the interpretation of the New York agreement:

CHICAGO, Nov. 10.—As the railroad war now in progress between the roads of the Southwestern pool bids fair to increase and involve many other roads of the country in complications not hitherto anticipated, and as no clear statement of the differences has yet been made, it is deemed important to give the following from the notes of Mr. Midgley, the Commissioner of the Southwestern pool, concerning the proceedings at secret meetings held in this city Monday and Tuesday of the companies interested:

Mr. Midgley, at Monday's meeting, said he had telegraphed Solon Humphreys, of the Wabash, as follows: "When I called roll on Southwestern agreement (in the New York meeting of presidents) I understood Mr. Blackstone to say he voted 'yes,' on understanding that its general terms should apply to the business between Chicago and St. Louis. Mr. Hopkins sat next to me, and I think he added 'And that the Wabash shall have one-third.' I stopped and proceeded to restate the vote, when Mr. Gould and others remarked, 'Never mind St. Louis business; leave that out.' Afterward you said to Mr. Blackstone you would have Chicago and St. Louis business taken up and disposed of fairly. I cannot certify to any agreement, except on Chicago and Southwestern business. The foregoing is the substance of my statement in the managers' meeting here last week." In reply, Mr. Humphreys sent the following letter:

"Your telegram of yesterday was received this morning, and I immediately replied that Mr. Gould was absent, etc. My recollection of Mr. Gould's remark is very distinct, as it relieved us of serious question as to how St. Louis and Kansas City business should be treated. Either Mr. Hopkins or I asked, as the vote was being taken, 'what about St. Louis and Kansas City?' Mr. Gould replied, as you state, 'Never mind that; leave that out,' and I stated, as I had previously stated, that we had a good many unlimited tickets out between these points, as Mr. Blackstone had stated his road also had. Mr. Gould again replied, 'Never mind; let them run.' As to my remark to Mr. Blackstone afterward, it had no reference to Chicago and St. Louis business, but to business to Jacksonville and other common points on our two routes to which we had sold unlimited tickets, and it was to the effect that we would have that business taken up and treated fairly, the same as I had already agreed with Mr. Riddle in the matter of Peoria. As you have made your statement to the managers, kindly read this letter to them at their meeting on Monday."

In Monday's meeting, Mr. How, for the Wabash road, stated that he had no proposition to make except that the New York agreement be followed out, and that the Wabash have one-third of the St. Louis business. He would, however, receive and transmit to Mr. Gould and Mr. Humphreys any proposition. Thereupon J. C. McMullin, of the Alton road, offered a proposition that they take up and perfect the details of the plan entered into by the New York presidents relative to Southwestern business, and to fix the percentages which should be submitted to arbitration. Without action, the meeting adjourned to allow Mr. How to consult his people in New York regarding the proposition to carry out the pool agreement made in New York as to Southwestern business.

In Tuesday's meeting Mr. Midgley explained some peculiarities in the notes of the New York meeting and the manner in which it was claimed Mr. Blackstone agreed to allow Wabash one-third of the St. Louis business. He also stated that Mr. Blackstone distinctly declared that he never agreed to that proposition; that Mr. Riddle, of the Rock Island road, agreed that Mr. Blackstone might very easily have voted under misapprehension as to the question, since it was in a muddled condition when put to the meeting, and that he (Midgley) fully believed that Mr. Blackstone did not vote to give the Wabash one-third of the St. Louis business. Mr. How then read telegrams from Mr. Humphreys declaring that Mr. Blackstone's statement to friends after the meeting confirmed the belief that he had voted to give the Wabash one-third of the business, and saying Wabash would accept nothing less; also a telegram from Jay Gould re-asserting and concurring

in Mr. Humphreys' statement of the facts in the case, and maintaining that the division of business was an equitable one. Mr. How then moved that the meeting proceed to put in operation the pools agreed to in the presidents' meeting, which, under the Wabash construction, and by the wording of Mr. How's resolution, would give Wabash one-third of the business. The motion received only one vote, all but the Wabash declining to vote on it. The original proposition to carry out the Southwestern pool arrangement was agreed to by a vote of the Chicago & Alton, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Hannibal & St. Joseph, and the Missouri Pacific Roads for it, the Wabash against it, and the Chicago & Northwestern, the Illinois Central, and the Vandalia declining to vote, not being a party to the New York agreement.

Mr. Midgley in all these proceedings has insisted that the parties who accused Mr. Blackstone of breaking an agreement are the ones who refused to allow a clear statement in the New York meeting of their proposition, and who refused to allow Mr. Blackstone to verify his vote after it was recorded. The question is an important one as tending to place the responsibility for what it threatens to be—the greatest passenger war in the history of the country.

Wednesday afternoon, at St. Louis, the ticket and passenger agents of the Wabash, the Indianapolis & St. Louis, the Ohio & Mississippi, and the Vandalia roads agreed upon the following special rates for limited tickets: Boston and New York, \$4.25; Philadelphia, \$3.75; Baltimore and Washington, \$3; Harrisburg, \$3.25; Pittsburgh, \$2.25; Buffalo, \$3.25; Parkersburg, \$1.05; Cleveland, \$1.25; Wheeling, 25 cents. This meets the rates made by the Chicago & Alton and the Lake Erie & Western, and goes below them to points east of Fremont, O. Thus the Alton has succeeded in its object of destroying the value of all the through travel from St. Louis eastward, and the whole railroad system of the country east of the Mississippi and north of the Ohio, almost, becomes interested in making a speedy end of the matter. Whether this will help one company more than another remains to be seen.

The First Railroad in New England.

The following was contributed to the Boston *Advertiser* as long ago as 1873 by a correspondent in Windham, Me.:

In Drake's valuable work "Old Landmarks and Historic Personages of Boston," published the present year, it is stated that in reducing West Hill, between Beacon and Cambridge streets, the Mount Vernon proprietors "employed the first railway used in New England by an inclined plane, over which box cars conveyed their loads to the water at the foot of the hill." It may perhaps be interesting to your readers to know that this same railway and cars, or others of similar construction, were used on Beacon Hill several years previous. This information I received two years ago from Edward Howe, Esq., a retired merchant of Portland, Maine, now 90 years old, who yet walks the streets and reads the papers every day when in ordinary health. He was born in Dorchester, Mass., July 12, 1783. His father, Abraham Howe, was a brick-maker in that ancient town—his brick-yard and dwelling (still standing) were where Adams street now is.

In 1795, at the age of twelve, young Howe, with his father's team, hauled one hundred thousand bricks from the kilns to the top of Beacon Hill, for the building of the State House, the corner stone of which was laid by ex-Governor Samuel Adams, July 4, of that year. Mr. Howe says that the hill was lowered about twenty feet before the foundation was laid; and in this work a railway of wood, of about two feet gauge, conveyed loaded cars to the foot of Beacon street, drawing up at the same time a train of empty cars by a rope over a pulley. The Mount Vernon proprietors' railway was not in use until the first five years of this century, and undoubtedly the same track and cars were transferred from Beacon to West Hill, some eight or nine years after they were employed on the site of the State House, and doubtless by the same contractor. Mr. Howe probably is the only one living who assisted in the construction of that building.

In a history of the Bunker Hill monument, published in the third volume of the collections of the Maine Historical Society, the statement is made that the Quincy Railway, constructed in 1826 to convey the stone for the monument from the quarry to the wharf for shipment, was the first railway in the United States. This might have been the first one in which iron was used on the track—yet Mr. Howe has the impression that there was a thin plate of iron on the track of the Beacon Hill Railway, although he is not certain. The Quincy Railway track was simply narrow plank set on edge three feet apart, and covered with thin iron. This mode of conveyance was soon abandoned, and the stone was drawn by teams direct from the quarry to the site of the monument.

The first solid iron rails laid and passed over by a locomotive engine drawing a train of passenger cars in New England, was on the Boston & Worcester road, in April, 1834; the engine and its driver were brought from England. The writer has a vivid recollection of a ride to Newton soon after on this road, and returning in a brakeman's seat, as a special favor, to see the country. This seat was on the top of the car, and the smoke and cinders were perfectly blinding, as the engine had no "spark catcher" like those now in use.

W. G.
WINDHAM, MAINE, Dec. 1, 1873.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends have been declared as follows:
Cleveland & Pittsburgh (leased to Pennsylvania Company), 1½ per cent., quarterly, payable Dec. 1.
Boston & Albany, 4 per cent., semi-annual, payable Nov. 15.

American Society of Civil Engineers.

At the twenty-eighth annual meeting, held Nov. 3, 1880, officers were elected for the ensuing year. As suggested by the circular recently issued, the meeting (after the presentation of reports and the canvass of the votes) was adjourned to meet on Wednesday, Nov. 17, 1880, at 10 a. m., at the Society House (No. 104 East Twentieth street, New York). The morning meeting of Nov. 17 will be occupied with discussion on Society business. Arrangements are in progress by the members resident in New York for a special meeting, with professional papers and discussions, for visits to points of engineering interest, for collations and for a reception. These arrangements will extend over the day and evening of both Wednesday and Thursday, Nov. 17 and 18. All members are invited to be present.

Western Society of Engineers.

The regular semi-monthly meeting was held in Chicago, Nov. 4, President Greeley in the chair. Mr. Benozette Williams offered a resolution, providing

that, as the society had attained such a position that it was warranted in pressing its claims for membership and support of engineers of all classes, the Secretary be requested to devote as much time as possible to increasing the well-being of the society, and that the trustees be authorized to expend such money as might be necessary for this work.

Mr. Williams explained that his idea in offering the resolution was that gentlemen engaged in mechanical and other branches of engineering might be induced to present themselves for membership.

The resolution was laid over until the next meeting.

Mr. John Zellweger then read a paper on the "Effect of Wind on Bridge Trusses." The subject was treated in a technical and scientific manner. The usual discussion followed, and the paper was ordered placed on the records. The society then adjourned.

Western Association of General Passenger and Ticket Agents.

A regular meeting of this Association began at the Lindell Hotel, St. Louis, last Wednesday (Nov. 10, 1880). The Executive Committee presented the following subjects for discussion in a circular issued Oct. 30:

First.—Uniformity in the colors or tints of coupon tickets. Why cannot the members of this Association, one and all, adopt uniform color or tints?

Second.—Is it not feasible, and of great utility and convenience, to give the actual numbers of the trains on our folders, and in the *Official Railway Guide*, instead of calling all trains "Fast Express?"

Third.—What is the best plan for running local excursions—to rent coaches, or to make reasonable rates, sell our own tickets and abandon the "renting out" plan?

Fourth.—Do all members of this Association give on their ticket report to foreign lines the through rate, commencing and closing, or consecutive numbers of tickets; also the actual name of station where tickets are sold, as well as the destination, form and division?

Fifth.—What is the best mode of doing a round trip local ticket business—to make a 10 or 15 per cent. discount on the double rates, and limit the tickets to a few days, or no limit?

Sixth.—Is it not a wise plan to pay our own ticket agents a commission on local ticket sales, thereby stimulating them to see that all passengers are ticketed?

Seventh.—In making a through rate between any two given points, from one part of the country to another, over two or more roads, why should not such rate be made by adding together the amounts of local ticket rates, which, when combined, make the smallest amount between the two points, from the fact that a passenger can pass between the two points for such combined amount?

Eighth.—Will each road in this Association devote a certain space in the *Official Railway Guide*, on their time-table page or pages, to give information regarding through cars, from and to what points they run, and on what trains? For example, see advertisements of C., B. & Q., Vandalia, and M., K. & T., in *Official Guide*.

Ninth.—Are there any roads in this Association, that, in reporting excess baggage collections to foreign lines, do not include the same on their foreign ticket report? If not, does the passenger department of the line reported to get credit, or does such item go into a miscellaneous account?

Tenth.—Why, if the expense of running and keeping up United States mail and express cars be charged to the passenger department service, should not the earnings on same be credited to the passenger department?

Eleventh.—Members are requested to come prepared to vote on the following questions regarding the issue of free transportation to editors of newspapers, in consideration of standing advertisements in said papers, viz.:

1.—Regular annual passes, good over all the lines of the roads issuing them.

2.—Regular annual passes, good only on the division of the road on which the editor lives.

3.—Trip transportation, in coupon book form, similar to that in use upon the Wabash, St. Louis & Pacific Railway.

4.—1,000 and 500-mile tickets.

5.—If annual passes are used, should they be provided with the photograph of the holder?

Twelfth.—Regarding newspaper advertising, members will be asked to consider the following:

1.—The minimum circulation a weekly paper shall have to warrant the roads in interest making an advertising contract with it.

2.—Shall members of the Association make standing advertising contracts with papers of their own lines?

3.—How old shall a paper be before an advertising contract is made with it?

4.—Shall free transportation of any kind be given to newspaper men, unless the roads giving it have a regular contract for advertising with the paper to which the applicant for the pass belongs?

5.—To prepare uniform proposition and contract blanks for newspaper contracts.

6.—Shall free transportation be furnished to any alleged newspaper correspondents or reporters (alleged to be exclusively so engaged or not), or shall the free transportation be confined exclusively to editors?

7.—Shall free transportation be furnished to editors, unless they are exclusively engaged upon their papers, and have no other business?

Thirteenth.—Some uniform system for conducting the theatrical business.

Fourteenth.—Uniformity in the issue of excess baggage tickets.

Fifteenth.—Such other subjects as may properly come before the meeting.

It will be evident to any general passenger or ticket agent, who reads the above, that the subjects for discussion are of sufficient importance to every line in this Association to warrant a full attendance, and that if they are considered with the care which their importance would seem to demand, the meeting will be a very interesting and profitable one.

ELECTIONS AND APPOINTMENTS.

American Society of Civil Engineers.—At the twenty-eighth annual meeting in New York, Nov. 3, the following officers were chosen: President, James B. Francis; Vice-Presidents, Ashbel Welch, Octave Chanute; Secretary and Librarian, John Bogart; Treasurer, J. James R. Croes; Directors, C. Vandervoort Smith, Joseph P. Davis, D. J. Whittemore, G. Bouscaren, Wm. H. Paine.

Baltimore, Cincinnati & Western.—Hon. Thomas L. Young, of Ohio, is to be President of this new company. Maj. A. H. Campbell is Engineer.

Boston & Lowell.—Mr. C. S. Melien has been appointed Assistant to the Manager, with office in Boston. He was formerly on the Northern (New Hampshire) road.

Charlotte, Columbia & Augusta.—Mr. J. S. Land has been appointed Master of Trains, in place of W. N. Royall, resigned.

Chicago, Burlington & Quincy.—Mr. John D. Besler has been appointed Superintendent of all this company's lines in

Illinois, except the line from Burlington to Quincy. Office at Galesburg, Ill.

Mr. L. A. Howland has been appointed Assistant Superintendent of Galesburg Division.

Mr. W. D. Rowley has been appointed Master Mechanic of the Chicago Division, with office at Aurora, Ill. Mr. Rowley has been for several years Master Mechanic of the Kansas City, St. Joseph & Council Bluffs road.

Cincinnati, Indianapolis, St. Louis & Chicago.—At the annual meeting in Indianapolis, Nov. 10, the following directors were chosen: Thomas A. Morris, Thomas H. Sharpe, Indianapolis; S. J. Broadwell, B. F. Evans, George Hoadley, M. E. Ingalls, John King, Jr., C. W. West, Cincinnati; J. H. Devereux, Cleveland; J. H. Parkins, Boston; George Bliss, C. J. Landon, New York. The board re-elected M. E. Ingalls, President; E. F. Osborne, Secretary and Treasurer.

Cincinnati, Sandusky & Cleveland.—At the annual meeting, Oct. 27, the following directors (one-third of the board) were re-elected: E. B. Sadtler, Sandusky, O.; J. S. Farlow, J. D. Farnsworth, Boston. The board re-elected J. S. Farlow, President; N. W. Pierce, Vice-President; J. L. Moore, Secretary and Treasurer.

Columbus & Rome.—The officers are now as follows: President, E. C. Hood; Treasurer and Superintendent, M. E. Gray; Engineer and Road-Master, F. H. Harris.

Foxburg, St. Petersburg & Clarion.—Mr. M. Mandeville has been chosen President, in place of Wm. L. Fox, deceased.

Hannibal & St. Joseph.—At the annual meeting in Hannibal, Mo., Nov. 1, the old board was re-elected, as follows: Myron P. Bush, Buffalo, N. Y.; Enoch Pratt, Baltimore; Henry H. Cook, Wm. Dowd, Jay Gould, Julius Hallgarten, Horace Porter, Elihu Root, Russell Sage, New York.

Kansas City, St. Joseph & Council Bluffs.—Mr. Frank A. Chase has been appointed Master Mechanic, in place of W. D. Rowley, transferred to the Chicago, Burlington & Quincy. Mr. Chase has been on the Chicago, Burlington & Quincy for many years as an engineer and for two years past as Foreman of the Aurora round-house.

Louisville, New Albany & Chicago.—Mr. Marshall Morris has been appointed Chief Engineer and Superintendent of Road, with office in Louisville.

Manhattan.—At the annual meeting in New York, Nov. 10, the following directors were chosen: C. K. Garrison, William R. Garrison, George J. Forrest, A. V. Stout, John P. Kennedy, Arthur Leary, Jose F. Nivars, Horace Porter, E. F. Winslow, William Foster, Jr., H. F. Dimock, R. M. Galloway, Mortimer Ward. For inspectors of next annual election, Lewis M. Brown, James Clyne, Charles T. Barney. The new board is entirely in the Metropolitan Elevated interest.

North Atlantic City.—The directors of this new company are: Isaac A. Braddock, E. Z. Collings, John S. Doughty, Henry Fowler, David Headley, Wm. Smedley, George W. Stever. The officers are: President, Wm. Smedley, Bryn Mawr, Pa.; Treasurer, Isaac A. Braddock, Haddonfield, N. J.; Secretary, David Headley, Philadelphia.

Paducah & Elizabethtown.—Mr. B. J. Horton has been appointed General Freight and Passenger Agent, with office at Elizabethtown, Ky., in place of B. F. Blue, resigned.

St. Louis Union Depot Co.—Mr. A. A. Talmage (General Superintendent of the Missouri Pacific) has been chosen President, in place of J. E. Simpson, deceased.

Scioto Valley.—The Board has elected C. O. Hunter, Wm. Long and E. F. Winslow, directors, in place of George D. Chapman, John G. Mitchell and Harford Toland, resigned.

Texas & Pacific.—Mr. Edward R. Murphy has been appointed Auditor, in place of Thomas D. Maurer, resigned. Mr. Murphy was recently Chief Clerk to the Comptroller of the Pennsylvania Railroad.

Toledo, Delphos & Burlington.—The following officers have been announced: W. J. Sherman, Chief Engineer in charge of road, bridges and buildings; J. W. McElvaine, Auditor; I. H. Burgoon, Superintendent of Transportation; H. Z. Eaton, Assistant Secretary, Cashier, Paymaster and Purchasing Agent; G. G. Grund, Acting General Freight and Passenger Agent; G. H. Tier, Master Mechanic. The offices of the Superintendent of Transportation and Master Mechanic are at Delphos, O. The others at Toledo.

Tonawanda Valley Extension.—This company has been organized with the following directors: R. S. Taylor, W. S. Bissell, Buffalo, N. Y.; J. D. V. Loomis, J. H. Loomis, R. S. Stevens, C. S. Thompson, Levi R. Vincent, Attica, N. Y.; G. C. Parker, Varysburg, N. Y.; G. R. Blanchard, E. S. Bowen, J. D. Fish, B. W. Spencer, New York.

Wabash, St. Louis & Pacific.—The following appointment have been made for the Peoria & Iowa Division: W. O. Hewitt, General Master Mechanic, in charge of Locomotive and Machinery Department; R. M. Hemphill, General Master Car-Builder, in charge of cars and car repairs; Theodore Higbie, Jr., Storekeeper, in charge of storehouse and all supplies, except stationery. The offices of all are at Peoria, Illinois.

Western North Carolina.—Mr. John R. Macmurdy has been appointed Auditor, General Freight and Passenger Agent. Office in Salisbury, N. C.

PERSONAL.

—Mr. J. A. Groat, late Master Mechanic of the Chicago & Paducah road, has accepted a position in Chicago, and will live in that city.

—Mr. George McHenry, a brother of James McHenry, came to this country about six weeks ago as representative of certain English bondholders who are opposed to the measures now in progress for the reorganization of the Philadelphia & Reading Company. A short time ago Mr. McHenry was taken with a severe attack of rheumatism, and he died in Philadelphia, Nov. 8, from prostration resulting from this attack.

—At the meeting of Grand Trunk stockholders in London, Oct. 28, the sum of £2,500 was voted to Mr. J. Hickson, the General Manager, in acknowledgment of his services to the company, "and especially for his energetic and judicious management and conduct of the negotiations in acquiring possession of the Chicago & Grand Trunk." In answer to a stockholder's question, Sir Henry Tyler said that Mr. Hickson's salary was £3,000 a year.

TRAFFIC AND EARNINGS.

Peoria Traffic.

Peoria, which is one of the competing points where trouble is most common, has been for some time charged with irregularities in rates. The Chicago, Peoria & Northwestern, which usually has carried but a trifling portion of the eastward ship-

ments, has recently greatly increased its proportion, and has done it, it is said, by making reductions from the regular rates. Under the apportionment, to which it was a party, it is entitled to but 5 per cent.

Railroad Earnings.

Earnings for various periods are reported as follows:

Ten months ending Oct. 31:				
	1880.	1879.	Inc. or Dec.	P. c.
Bur., Cedar Rap. & No.	\$1,070,733	\$1,210,060	I.	\$459,773 38.0
Chi. & Alton	6,418,943	4,001,532	I.	1,817,411 39.5
Chi. & Eastern Ill.	1,041,433	704,054	I.	336,479 47.7
Chi. & Northwest	16,003,523	13,214,002	I.	2,789,521 21.2
Chi., St. P., Minn. & O.	1,206,946	982,714	I.	284,232 29.0
Cin. & Springfield	724,841	637,300	I.	87,541 13.7
Cleve., Col., Cin. & Ind.	3,536,439	2,975,170	I.	561,269 18.9
Denver & R. G.	2,891,858	900,504	I.	1,728,554 178.9
Det., Lan. & No.	985,254	904,672	I.	80,582 8.9
Flint & Pere Mar.	1,292,374	917,100	I.	375,274 40.9
Grand Trunk	8,658,204	7,278,518	I.	1,379,686 18.9
Great Western	4,203,992	3,605,814	I.	598,178 16.6
Hannibal & St. Jo.	2,048,303	1,550,947	I.	497,356 32.1
Houston & Tex. C.	2,633,446	2,200,790	I.	432,656 19.5
Ill. Cent. Ill. lines.	5,228,822	4,699,480	I.	529,342 11.3
Iowa lines.	1,372,802	1,247,573	I.	125,229 10.0
Int. & Gr. No.	1,430,095	1,312,780	I.	117,315 10.5
Louisv. & Nash.	7,571,836	6,028,542	I.	1,543,294 25.5
Mem. & Charleston	578,408	500,758	I.	77,650 15.4
Mo., Kan. & Texas	3,433,319	2,576,278	I.	857,041 33.3
Mo. Pacific	4,453,864	3,183,803	I.	1,270,061 39.7
N. Y. Cent. & H. R.	27,724,474	23,719,381	I.	4,005,093 16.9
St. L., A. & T. H.	1,164,522	829,169	I.	335,353 40.4
St. L., Iron Mt. & So.	4,000,369	3,080,366	I.	980,003 31.8
St. L. & San Fran.	2,186,037	1,241,085	I.	945,552 76.2
St. P., Minn. & Man.	2,559,429	2,143,211	I.	416,218 19.4
St. P. & Sioux City	1,195,851	907,555	I.	288,296 31.8
Scioto Valley	282,902	235,778	I.	47,124 11.5
Wabash, St. L. & P.	10,267,873	7,266,105	I.	3,001,768 41.3

Nine months ending Sept. 30:				
	1880.	1879.	Inc. or Dec.	P. c.
Houston & Texas	\$2,159,580	\$1,800,230	I.	\$359,344 19.9
Central	923,718	680,785	I.	242,933 32.2
Pitts., Titusv. & Buff.	428,458	347,224	I.	81,234 23.4
Net earnings	201,548	134,733	I.	66,815 49.6
Wisconsin Central	805,310	580,703	I.	224,607 38.6
Net earnings	146,797	88,837	I.	57,960 65.0

Month of September:				
	1880.	1879.	Inc. or Dec.	P. c.
Gal., Har. & San Antonio	\$147,785	\$131,365	I.	\$16,420 12.5
Grand Trunk	\$192,511	\$168,522	I.	\$23,989 14.1
Net earnings	68,647	51,001	I.	17,646 32.1
Great Western	\$426,600	\$347,300	I.	\$79,300 22.9
Net earnings	168,900	121,000	I.	47,900 38.5
Houston & Texas	400,367	365,440	I.	34,927 12.0
Cent.	98,302	42,083	I.	56,219 133.5
Minn. & St. Louis	483,661	423,520	I.	60,141 11.4
N. Y., Penna. & Ohio	106,002	76,101	I.	29,901 39.3

Month of October:				
	1880.	1879.	Inc. or Dec.	P. c.
Bur., Cedar Rap. & No.	\$204,991	\$171,524	I.	\$33,467 19.4
Chi. & Alton	768,110	608,193	I.	159,917 17.7
Chi. & Eastern Ill.	130,891	92,975	I.	37,916 40.8
Chi. & Northwest	2,031,000	1,896,073	I.	134,927 7.1
Chi., St. P., Minn. & O.	190,403	147,605	I.	42,798 28.9
Cin., Ind., St. L. & Chi.	227,351	207,450	I.	19,901 9.6
Cin. & Springfield	93,506	95,465	D.	1,959 2.0
Cleve., Col., Cin. & Ind.	444,104	423,257	I.	20,847 4.9
Det., Lan. & No.	114,200	116,698	D.	2,498 2.1
Flint & Pere Mar.	158,752	123,570	I.	35,182 28.5
Hannibal & St. Jo.	240,350	239,735	I.	615 0.2
Houston & Texas	476,806	406,504	I.	70,302 17.3
Cent.	675,091	625,049	I.	50,042 7.9

Iowa lines.				
	1880.	1879.	Inc. or Dec.	P. c.
Int. & Gr. Northern	185,033	181,910	I.	3,123 1.7
Int. & Gr. Northern	276,646	228,800	I.	47,846 20.0
Louisv. & Nash	1,000,000	609,578	I.	390,422 64.0
Memphis & Charleston	125,731	60,096	I.	65,635 109.3
Mo., Kansas & Texas	407,549	387,710	I.	19,839 5.1
Mo. Pacific	546,027	434,266	I.	111,761 25.7
N. Y. Central & H. R.	3,095,198	2,898,586	I.	196,612 6.8
St. L., A. & T. H.	137,045	116,682	I.	20,363 17.5
Main Line	678,200	724,713	D.	46,513 6.4
St. L., Iron Mt. & So.	310,582	213,712	I.	96,870 45.3
St. L. & San Fran.	345,057	291,292	I.	53,765 18.5
St. P., Minn. & Man.	153,344	121,618	I.	31,726 26.1
St. P. & Sioux City	30,172	30,249	D.	77 0.2
Scioto Valley	1,520,475	1,198,076	I.	322,399 27.4

Third Week in October:				
	1880.	1879.	Inc. or Dec.	P. c.
Minn. & St. Louis	\$18,557	\$12,916	I.	\$5,641 43.7
First Week in November:				
Northern Pacific	\$70,300	\$46,005	I.	\$24,295 50.6
Eastern Div.	\$250,630	\$220,578	I.	\$30,052 13.4

Grain Movement.

For the week ending Oct. 30, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

(Northwestern Shipments.)				
Year.	Northwestern Receipts.	Total.	By rail.	P. c.
1873	3,424,584	3,385,008	616,814	18.0
1874	2,578,641	2,412,374	292,512	12.2
1875	4,251,118	4,570,680	1,154,484	25.2
1876	4,308,747	3,902,072	2,351,914	60.3
1877	5,071,008	3,827,013	587,178	15.5
1878	4,803,449	4,088,021	905,027	22.1
1879	7,190,708	4,443,656	1,390,496	31.3
1880	8,100,032	4,748,761	2,330,182	34.4
				100.198

Baltimore 17, Philadelphia 12.7, Boston 5.3, Montreal 3.8, New Orleans 3.5, and Portland 0.2 per cent.

Of the 1,400,000 bushels gain over the previous week, New York gets 1,380,000. Philadelphia loses a little, but is still above on receipts it has had since the middle of July until the last few weeks. Baltimore gains just about as much as Philadelphia loses, and has its largest receipts for eleven weeks. Montreal has not had so small receipts before since navigation fairly opened.

Exports from Atlantic ports for four successive weeks have been:

	Week ending—	Nov. 3.	Oct. 27.	Oct. 20.	Oct. 13.
Flour, bbls.		92,803	75,575	107,509	
Grain, bush.		5,072,436	5,302,054	5,800,518	5,837,439

During the eight weeks ending Oct. 30 the exports have been:

	1880.	1879.	Inc. or Dec.	P. c.
Flour, bbls.	771,872	835,174	D. 63,302	7.6
Wheat, bush.	24,954,194	36,821,061	D. 11,867,797	32.2
Corn, "	16,453,700	10,316,558	I. 6,137,142	59.5
Rye, "	855,392	1,389,924	D. 283,532	24.9
Penns. "	1,199,523	990,543	I. 208,980	21.1
Oats, "	20,462	222,181	D. 201,719	90.8

	1880.	1879.	Inc. or Dec.	P. c.
Total grain.	43,483,241	40,489,867	D. 6,003,626	12.1
Flour to bushels.	3,859,990	4,175,870	D. 316,510	7.6
	47,342,601	53,665,737	D. 6,323,136	11.8

Thus the decrease of nearly one-third in the wheat exports of September and October is only partly made up by the increase of nearly 60 per cent. in the corn exports.

Receipts and shipments of grain at Chicago and Milwaukee for the week ending Nov. 4, have been:

	Receipts.	Shipments.	1880.	1879.	1880.	1879.
Chicago	3,486,452	2,918,929	3,748,895	2,397,787		
Milwaukee	709,291	807,900	286,090	761,800		

At Chicago there is an increase of 19 per cent. in the receipts, and 56 per cent. in the shipments; at Milwaukee a decrease of 12 per cent. in the receipts, and 65½ per cent. in the shipments.

For the same week, ending Nov. 4, receipts and shipments at Buffalo have been:

	Receipts.	Shipments.	1880.	1879.	1880.	1879.
By water.	2,402,185	1,748,510	1,092,500	2,476,158		
By rail.	687,300	531,900	1,172,300	920,650		
Total.	3,089,485	2,280,410	2,264,800	3,396,808		

Here there is an increase of 37½ per cent. in lake receipts, of 29 per cent. in rail receipts, and of 35½ per cent. in total receipts; and a decrease of 56 per cent. in canal shipments, an increase of 27½ per cent. in rail shipments, and a decrease of 33½ per cent. in total shipments. We cannot explain why there was such a decrease in canal shipments, unless it were on account of the election.

San Francisco wheat exports for the four months of the California crop year ending Oct. 31 were: 1880, 4,349,775 bushels; 1879, 7,237,037 bushels, 1878, 7,532,350 bushels. A large surplus for export is reported this year, but it is coming forward very slowly.

Coal Movement.

Anthracite tonnages for the ten months ending Oct. 30 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1880.	1879.	Inc. or Dec.	P. c.
Pblla. & Reading.	4,908,086	6,254,215	D. 1,346,129	21.5
Northern Central.				
Shamokin Div. and Summit Br. R.R.	740,427	777,035	D. 36,608	4.7
Sanbury, Hazelton & Wilkesbarre.	8,515	20,004	D. 12,089	58.7
Pennsylvania Canal.	411,763	301,000	I. 20,163	5.1
Central of N. J., Lehigh Valley.	3,104,882	3,354,004	D. 249,122	7.4
Lehigh Valley.	3,096,786	3,580,241	I. 26,545	0.7
Pennsylvania & N. Y.	30,998	28,741	I. 2,257	7.8
Del., Lacka. & Western.	2,865,550	3,143,303	D. 277,744	8.8
Del. & Hudson Canal Co.	2,440,043	2,808,100	D. 368,153	12.9
Pennsylvania Coal Co.	908,888	1,187,592	D. 278,704	23.5
State Line & Sullivan.	37,181	40,111	D. 2,930	7.3
Total anthracite.	19,069,128	21,585,042	D. 2,516,514	11.7

The tonnage of anthracite for the corresponding period for six years has been:

	1880.	1879.	1878.	1877.	1876.	1875.
	19,069,128	21,585,042	18,775,000	14,626,835	15,976,086	16,610,626

Anthracite coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the ten months ending Oct. 30 was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Coal Port for shipment.	43,039	22,407	I. 20,632	92.1
South Amboy for shipment.	393,925	368,252	I. 25,673	7.0
Local Distribution on N. J. lines.	400,788	278,793	I. 122,095	45.9
Co.'s use on N. J. lines.	87,082	77,748	I. 9,334	12.0

Total. 930,834 747,198 183,636 24.6

Of the total this year 752,735 tons were from the Lehigh, and 78,099 tons from the Wyoming Region. Actual tonnage of anthracite passing over the Pennsylvania & New York road for the eleven months of its fiscal year from Dec. 1 to Oct. 30 was: 1880, 618,181; 1879, 708,140; decrease, 177,959 tons, or 22.4 per cent. Of the total this year 802,002 tons were received from the Lehigh Valley road.

Anthracite trade generally is good; a large demand is reported and prices are very steady.

Semi-bituminous tonnages reported for the ten months were as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Cumberland.	1,771,006	1,251,841	I. 519,165	41.5
Huntingdon & Broad Top.	148,708	118,082	I. 28,626	24.3
East Broad Top.	55,907	53,751	I. 2,156	4.0
Tyrone & Clearfield.	1,390,830	1,330,728	I. 60,102	4.5
Bellefonte & Snow Shoe.	46,094	53,371	D. 7,277	13.5

Total semi-bituminous. 3,410,645 2,807,673 602,972 21.5

Actual tonnage passing over the Huntingdon & Broad Top road for the ten months was:

	1880.	1879.	Inc. or Dec.	P. c.
Broad Top coal.	140,708	118,082	I. 28,626	24.3
Cumberland coal.	213,779	145,023	I. 68,756	47.4

Total. 360,487 263,105 97,382 37.0

The Broad Top coal is mined on the line; the Cumberland carried through from Mt. Dallas to Huntingdon.

Distribution of Cumberland coal for the ten months was as follows:

	1880.	1879.	Inc. or Dec.	P. c.
By Balt. & Ohio R. R.	1,002,487	732,970	I. 269,517	36.8
By Bedford Div., Pa. R. R.	180,702	129,012	I. 51,690	44.8
By Chesapeake & Ohio Canal.	580,751	387,472	I. 193,279	49.9

Total. 1,763,940 1,249,454 514,486 41.7

These figures are shipments away from the region; the

total in the table above is the shipments from the mines to Cumberland.

Bituminous tonnages reported for the ten months are:

	1880.	1879.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co.	395,713	270,145	I. 125,568	46.5
Allegheny Region, Pa. R. R.	251,039	158,362	I. 92,677	58.8
Penn. and Westmoreland.	780,303	621,003	I. 159,300	25.6
West Penn. R. R.	232,398	174,515	I. 57,883	33.4
Southwest Penn. R. R.	36,849	33,601	I. 3,248	9.7
Pittsburgh Region, P. R. R.	464,469	430,431	I. 34,038	7.9

Total bituminous. 2,170,765 688,057 482,708 28.6

It must be understood that these figures do not cover the whole bituminous trade even of Pennsylvania alone. Tioga, McKean and other counties in Northern Pennsylvania make no weekly or monthly reports, and no figures are received for the vast river trade from Pittsburgh. It is much to be regretted that fuller statistics are not attainable.

Coke tonnages reported for the ten months are as follows:

	1880.	1879.	Inc. or Dec.	P. c.
Allegheny Region, P. R. R.	50,586	41,354	I. 9,232	22.3
Penn. and Westmoreland.	112,230	77,164	I. 35,066	45.4
West Penn. R. R.	66,499	77,443	D. 10,947	14.1
Southwest Penn. R. R.	902,494	789,875	I. 112,619	15.6
Pittsburgh Region, P. R. R.	411,049	166,479	I. 244,570	146.9

Total coke. 1,542,855 1,143,315 399,540 34.9

The coal tonnage of the Pennsylvania Railroad for the ten months was:

	1880.	1879.	Inc. or Dec.	P. c.
Anthracite.	989,006	862,584	I. 126,422	14.8
Semi-bituminous.	1,796,230	1,624,928	I. 171,302	10.5
Bituminous.	1,775,052	1,446,653	I. 328,399	22.7
Coke.	1,542,855	1,161,757	I. 381,098	32.8

Total. 6,104,043 5,095,922 1,008,121 19.8

The tonnage for October was 655,432 tons, a decrease of 25,871 tons, or 3.8 per cent., from the September tonnage.

Coal shipments from Pictou, Nova Scotia, to the end of October were: 1880, 238,681; 1879, 185,672; increase, 53,009 tons, or 28.5 per cent., showing a very considerable gain this year, and nearly 100 per cent. over 1878.

Chicago Live-Hog Movement.

Receipts and shipments of live hogs at Chicago for the twelve months ending with October have been:

	1879-80.	1878-79.	1877-78.
Receipts.	6,771,498	6,559,218	5,992,836
Shipments.	1,455,574	1,648,816	1,224,260

This year the receipts were 3.2 per cent. more and the shipments 11.7 less than last year, and the receipts 13 per cent. and the shipments 18.9 per cent. more than in 1877-78. The difference between the receipts and shipments is substantially what is packed in Chicago.

Estimates made of the number of live hogs now in the Western States, based on reports to state auditors, show very little change from the past two years—2½ per cent. more than last year and 0.8 per cent. more than in 1878. This indicates that there is not likely to be any great change from the live-hog and provision shipments of the past two years, though a good deal depends upon prices, as, if these are high, farmers will sell nearly everything they can fit for market.

Petroleum Exports.

The exports from Atlantic ports for five years have been, in gallons:

	1880.	1879.	1878.	1877.	1876.
	202,444,286	338,457,059	285,009,420	308,126,355	210,509,094

This year the exports are 13.6 per cent. less than in 1879, 2.5 per cent. more than in 1878, and 5.1 per cent. less than in 1877. During the past month the amount of decrease has grown, the exports of the four weeks for the several years having been:

	1880.	1879.	1878.	1877.	1876.
	31,340,341	43,373,015	39,813,811	31,877,043	16,690,234

Thus the exports of the month are 39 per cent. less than last year, and smaller than in any other year since 1876. The percentages exported from the several ports were:

	1880.	1879.	1878.	1877.	1876.
New York.	70.2	71.6	66.7	71.4	57.2
Boston.	1.2	1.7	1.0	1.2	1.1
Philadelphia.	17.4	20.2	20.2	12.9	26.2
Baltimore.	4.9	6.1	11.8	12.3	15.5
Richmond.	0.3	0.4	0.1	1.6	
Portland.			0.2	0.6	
Total.	100.0	100.0	100.0	100.0	100.0

Not only has New York gained in proportion this year, but it has done so notably in the last month, when 95.3 per cent. of all the exports were from New York, which thus seems to have almost monopolized the business.

Delaware Fruit Traffic.

The total shipments of peaches over the Delaware Railroad and branches for the season of 1880 were 1,822,259 baskets (of about 30 lbs. each), of which 56,418 went to local Delaware points, 8,251 to local points on Philadelphia, Wilmington & Baltimore, 26,735 to Wilmington, 15,804 to Chester, 212,730 to Philadelphia for local use, 45,104 to Philadelphia & Reading road, 9,067 to main line of Pennsylvania road, 1,150,142 to Pennsylvania, New Jersey Division, for Jersey City and local, and 207,998 to the same line for shipment to points east of Jersey City.

This does not include the large shipments to Baltimore, which go chiefly by boat, nor the shipments over the Junction & Breakwater road and branches to Lewes and thence by steamer, nor some 77,000 baskets by the Delaware & Chesapeake Canal.

The total shipments for 14 years past have been 23,365,427 baskets, showing an average of 1,668,959 baskets per annum. The worst year of the lot was 1868, when only 5,227 baskets were left by the frost, and the biggest year was 1875, when 4,330,036 baskets were shipped. The order of the years for extent of the peach crop was as follows: 1875, 1871, 1879, 1877, 1869, 1880, 1873, 1870, 1876, 1867, 1874, 1878 and 1868.

New England Railroad Returns.

The following figures are from advance copies of statements made to the Massachusetts and Connecticut Railroad Commissioners for the year ending Sept. 30, 1880:

	Earnings.	Expenses.	Net earnings.
Conn. Western.	\$238,810	\$15,360	\$223,450
Danbury & Norwalk.	184,447	124,327	60,120
Housatonic.	740,998	574,003	166,995
Naugatuck.	592,454	350,088	242,366
New Canaan.	14,188	7,358	6,830
New York, New Haven & Hartford.	4,390,133	2,436,887	1,953,246
Shepaug.	61,304	41,456	19,848

These returns are showing, almost without exception, a large increase in gross earnings, but a much smaller proportional increase in net earnings.

Southwestern Association Rates.

Monday, Nov. 8, grain rates from Missouri River points to Chicago were reduced to 25 cents for wheat and 20 cents

for other grain to Chicago—a reduction of 2½ cents from the rate of Nov. 1, when the rates from Missouri River points to St. Louis and other Mississippi River points (Louisiana, Hannibal, West Quincy and Burlington), Milwaukee and Toledo were announced as follows, in cents per 100 lbs.:

	Packed meats.	Bulk and meats.	Wheat and flour.	Other grain.	Fresh beef.*
To Miss. River points.	20	20	20	15	35
" Chicago.	20½	27	27½	22½	40
" Milwaukee.	20	20½	30	25	51½
" Toledo.	30½	38	32½	27½	..

* In refrigerator cars.

Hereafter furniture shipments will be estimated at a minimum weight of 25,000 lbs. per car for 28 ft. cars, and at 28,000 lbs. for cars 33 ft. long or more.

Prosecuting Scalpers and Selling them Unlimited Tickets.

The question whether, under the existing law regulating the sale of railroad tickets, the railroads have a right to sell tickets in large quantities to speculators and scalpers, knowing that such tickets must necessarily be sold again by parties who, under the Illinois law, have no right to deal in railroad tickets, is now likely to be decided by the courts. A suit has been brought by Mr. Jacob Frank, a ticket-scalper of Cincinnati, against the Wabash, St. Louis & Pacific road for violation of contract, setting his claim and damages at \$15,000. The petition filed by the plaintiff quotes the following contracts, and which will cause widespread attention in railroad circles:

(Letter heading of Wabash Road).

"\$1,000. CHICAGO, Ill., Oct. 30, 1880.
Received of Jacob Frank \$1,000 as a deposit for 1,000 tickets Chicago to Kansas City at the rate of \$8 each, via St. Louis, first-class, good until used.

"W. P. FOSTER, City Passenger Agent.
"Balance of \$7,000 to be remitted inside of twenty days."

(Letter heading of Wabash Road).

"\$500. CHICAGO, Oct. 18, 1880.
Received of Jacob Frank \$500 as a deposit for 200 second-class tickets reading 'Chicago to Kansas City,' good until used; the balance, \$500, to be paid on or before Oct. 30, 1880.
W. P. FOSTER, City Passenger Agent."

Mr. Frank obtained these contracts during the late war, in the presence of and with the knowledge of General Passenger Agent Townsend. He returned to Cincinnati, and Wednesday last week came back to this city and tendered the deferred payments in legal tenders, and in the presence of witnesses. Delivery of the tickets was positively refused. Leaving the \$1,500 in the hands of those who had received for it in the name of the Wabash Company, Mr. Frank returned to Cincinnati and placed the case in the hands of his attorney. He lays his damages at \$12,000 in one case and \$3,000 in the other. He stated to a Cincinnati Commercial reporter a day or two ago that he was at a loss to understand the action of the Wabash Company, as it subsequently sold such tickets as his contract called for at the same rates, he having bought some since at a slight advance.

The Wabash Company will no doubt set up the plea that the transaction was contrary to the so-called Illinois scalpers' law, and therefore void. The result of this suit will be watched by the railroad men and scalpers with much interest, as it will determine whether railroad companies can sell unlimited tickets to speculators in the state when the law provides that none but authorized railroad agents shall traffic in railroad tickets.

It will take the railroads some time before they get over the troubles arising from the sale of unlimited tickets during the late war at greatly reduced rates, and right afterwards raising the rates again to former figures, thus enabling speculators to reap a rich

of course obtained than in the years of depression that preceded 1879, but nothing more than fairly remunerative prices were paid or demanded. The average rates for the month of October, in which the largest amount, 16,186,000 bushels, ever received in a single month were reported, is a fair sample of the way rates have ruled for the whole season. The following is the average freight for October by lake and canal for the past ten years:

Year.	—Lake.—		—Canal.—	
	Wheat. cents.	Corn. cents.	Wheat. cents.	Corn. cents.
1871.....	10.1	9.7	15.7	14.1
1872.....	10.5	15.5	14.2	12.6
1873.....	7.8	6.8	12.7	11.3
1874.....	4.1	3.8	9.6	8.6
1875.....	3.7	3.4	8.2	7.4
1876.....	4.4	4.0	8.1	7.5
1877.....	4.9	4.4	10.6	9.2
1878.....	3.6	3.3	8.0	7.0
1879.....	7.7	7.1	9.0	7.9
1880.....	6.8	6.3	6.7	6.0

The record of the lake and canal trade for this year should convince the people, not only of the state of New York but of the whole country, that no effort or expense should be spared to bring this great national highway to the greatest possible condition of efficiency at the earliest possible date. Cheap transportation for the products of the interior is a subject in which the entire country is directly interested, and it can be better attained through the agency of the lakes and the Erie Canal than in any other way.—*Buffalo Commercial Advertiser*, Nov. 6.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior Region up to Nov. 3 are reported by the *Marquette Mining Journal* as follows, in tons:

	1880.	1879.	Inc.	P.c.
From L'Anse.....	51,779	38,769	13,010	33.5
From Marquette.....	609,538	487,013	122,525	25.2
From Escanaba.....	1,084,962	682,254	422,738	63.8
Total.....	1,746,309	1,188,036	558,273	47.0

Of the total shipments from Escanaba this year 555,703 tons were from the Marquette District, and 529,289 tons from the Menominee mines. Besides the ore shipped by lake the railroads delivered 43,416 tons to local points.

Shipments of pig-iron from Marquette were 7,363 tons.

RAILROAD LAW.

Measure of Land Damages—Benefits.

In the Pennsylvania Supreme Court, at Pittsburgh, Nov. 9, an opinion was filed in the case of the Pittsburgh & Lake Erie Co. vs. Robinson, Rea & Co., which reverses the action of the court below and remands the case for a new trial. Suit was brought by Robinson, Rea & Co. in the Common Pleas Court of Allegheny County for damages arising out of the trespass of the road on their premises on the South Side, Pittsburgh. The jury awarded damages in the sum of nearly \$17,000. From this verdict the defendants took a writ of error, and to-day obtain a reversal of the judgment of the lower court.

In the opinion filed Justice Paxson says: "Considering only the advantages and disadvantages, special and peculiar, resulting to the plaintiff's property by reason of the introduction of the defendant's road upon it, what was the difference in its value in the real estate market before and after the building of that road? The resolution of this question solves the problem. The property in question is used for manufacturing and ordinarily the market values of such lands are advanced by the introduction of railroads; this fact is one upon which the jury must pass, for much depends upon the situation of the property and the accessibility of the road which traverses it. If that road is carried through it on an embankment so high or in a cut so low, that it can not be reached by a switch it is useless to the property; on the other hand, if the road is on grade or nearly so, that by a siding or switch it may be made useful and convenient for the purposes for which the property is used, the value of the property may be greatly enhanced thereby. How, then, can any one contend that either of the above conditions may not be given in evidence?"

The opinion takes the ground that the court below erred in refusing to allow defendants to show that they had built their depot so as to be convenient of access by plaintiffs.

Negligence—Responsibility for Children.

The Pennsylvania Supreme Court has just given its decision in Canley against the Pittsburgh, Cincinnati & St. Louis Co. This was a case where the plaintiff, a minor, who is represented by his father, brings suit against the railroad company for damages done the boy while playing upon the defendant's cars. The case was taken up from the Court of Common Pleas of Allegheny County, where a verdict adverse to plaintiff was found. Justice Paxson, in quashing the writ of error, refers to the opinion of Chief Justice Strong in a similar case, as follows: "Except at crossings, where the public have a right of way, a man who steps his foot upon a railroad track does so at his peril. The company has not only a right of way, but it is exclusive at all times and for all purposes." Justice Paxson continues: "We live in the age of steam and of rapid development. The world demands quick transportation. Increased speed necessitates increased danger. Holding, as we do, such corporations to a strict responsibility for negligence, it is our duty to give them a clear track. This rule is not only proper in itself, but is necessary for the preservation of life. Its propriety is no longer a subject for discussion. It also is to be equally well understood that parents who permit their children to trespass upon the track of a railroad are guilty of negligence. It is not only gross but culpable negligence, as it imperils the lives of the children so trespassing, as also the lives of the traveling public. * * The child was playing upon the car where he ought not to have been, by the negligence and want of care of his father."

Elevated Railroads as Real Estate.

In the case of the New York Elevated Railroad Co. against the Commissioners of Taxes of New York City, the New York Court of Appeals has just rendered a decision. It has not yet been published, but it is understood that it fully supports the decision of the lower court, holding that the elevated railroad structures are to be considered as real estate and are liable to taxation as such.

THE SCRAP HEAP.

Railroad Equipment Notes.

The Harlan & Hollingsworth Co., at Wilmington, Del., is building six sleeping and 20 passenger cars for the Chicago, Milwaukee & St. Paul; five sleeping coaches for the Baltimore & Ohio; passenger coaches for the Atchison, Topeka & Santa Fe, the Mobile & Ohio and the George's Creek & Cumberland roads. They have also a large quantity of work on hand for foreign countries, including passenger and freight cars for Brazil and passenger cars for Spain (as

noted elsewhere), Mexico and the West Indies. The shops of the company are all very busily employed.

The Baldwin Locomotive Works, in Philadelphia, have recently taken orders for 32 locomotives for the Denver & Rio Grande, 30 for the Philadelphia & Reading, 20 for the Chicago & Northwestern and several smaller orders. Orders are on the books from Australia, Brazil, Peru, Cuba, Yucatan and Mexico.

There has been placed in the Helmbacher Forge and Rolling Mill, St. Louis, a machine that is capable of manufacturing 3,000 car coupling-pins per day, and is so arranged that the shaping dies may be changed to make any kind of pin desired. The inventor is Mr. L. Acheson, an energetic and valuable young mechanic in the employ of Messrs. Helmbacher. The simplicity of the mechanism of this machine is remarkable, all the motion required to actuate the six dies by which the pins are formed being imparted by but three cams. Mr. Acheson is now perfecting a machine by which coupling links are to be made, which is expected to be finished and in operation in two or three weeks.—*Pittsburgh Manufacturer*.

The Boston & Albany shops at Allston, Mass., have received orders to build a large number of freight cars for the road.

The car works of Blain Brothers, at Huntingdon, Pa., employ about 150 men. They are repairing a large number of cars for the Pennsylvania Railroad and have a contract for 600 box cars for the New Orleans Pacific.

The Jackson & Sharp Co., at Wilmington, Del., have recently shipped 12 passenger cars, all to southern roads.

The Rogers Locomotive Works, at Paterson, N. J., have lately completed six Mogul freight-engines for the Louisville & Nashville road.

The Chicago Car Axle Co., at South Chicago, are building an extension 120 by 50 ft. and adding new machinery to the works.

Iron and Manufacturing Notes.

The Kansas Rolling Mill, at Rosedale, Kan., is furnishing the iron rails for the Keokuk & Northwestern road.

Benwood Furnace, at Martin's Ferry, O., has been repaired and is nearly ready to go into blast.

The new furnace—No. 3—of the Crane Iron Works, at Catasqua, Pa., went into blast Oct. 25. It is 60 ft. high and 16 ft. bosh, and has all the latest improvements.

The Western Fence Co., Chicago, representing the construction department of the Thorn Wire Hedge Co., has large contracts for fencing on the Wabash, St. Louis & Pacific, the Grand Trunk and the Indianapolis, Decatur & Springfield road.

The Lawrence Rolling Mill, at Ironton, O., is running full double turn.

Berkshire Furnace, in Heidelberg, Berks County, Pa., is the oldest furnace in that section. It made cannon balls during the Revolutionary War.

The Chester Tube Works, at South Chester, Pa., will be sold at assignee's sale Nov. 17. The property consists of 17 acres of land, with extensive buildings, engines, boilers and a full plant for the manufacture of boiler tubes and wrought-iron pipe.

Levi Houston, at Montgomery, Lycoming County, Pa., has several orders for wood-working tools to go to New Zealand and Australia.

Bridge Notes.

The Phoenix Iron Co., at Phoenixville, Pa., has lately shipped two bridges to the Great Western Railway, of Canada, and is finishing several iron bridges to go to Mexico.

The Corrugated Metal Co., of East Berlin, Conn., has the contract for an iron highway bridge over the Ashuelot River in the town of Gilsun, N. H.

The contract for the bridge over the Assiniboine River, at Winnipeg, Manitoba, has been awarded to the Cleveland (O.) Bridge & Car Works. They were the lowest bidders. The bridge is to be completed by March next.

Prices of Rails.

Of steel rails the *Iron Age* says: "The market gives evidence of further improvement, and it would be more difficult to place orders to-day than it was a week ago. Sales during the past ten days amount to about 20,000 tons, divided among Pennsylvania manufacturers, at prices from \$60 at mill to something lower, according to time of delivery. English rails would cost nominally about the same as American rails, but they cannot be sold unless at \$2 to \$3 per ton less money. Several reasons are given for this discrepancy, chiefly, however, because of the difficulty in regard to deliveries. It is not always possible to secure freight room at the time desired, but on arrival they must be received, regardless of buyers' convenience. When contracts are made with American mills, deliveries may be delayed for a while if found desirable, or under reverse circumstances may occasionally be hurried somewhat. Freight to points of delivery can also be arranged easier, and on better terms, too, than when the goods are of foreign manufacture. Then the mills are located at various points, each one having special advantages in competing for orders from roads in their immediate vicinity. This is in some measure neutralized when seaboard deliveries are required, which, however, are comparatively infrequent. Then there is the difficulty of enforcing contracts with parties at a distance, especially when there is but little probability of permanency in business relations between the parties. These and other causes appear to make a difference of \$2 to \$3 per ton, and unless foreign rails can be laid down at \$55 to \$57.50, American manufacturers will probably be able to maintain their prices as above mentioned, say \$60 at mill."

Iron rails are more active, and sales of several thousand tons are reported at from \$46 to \$51 per ton at mill, according to section. No decline is expected at present. New York quotations are \$46 to \$48.

Old iron rails are stronger. Small sales are reported in Philadelphia at \$25.75 to \$26.50, but holders are looking for better prices and ask \$27 to \$28 per ton. A sale is reported in New York of rails to arrive at about \$29 per ton landed.

Pittsburgh quotations for spikes are \$2.65 to \$2.75 per 100 lbs.; track-bolts, \$3.50 for square and \$4 for hexagon heads; splice bars, \$2.25 per 100 lbs., all 30 days' time.

Four Hundred Miles an Hour.

In the *New York World* of Nov. 4 appears the following letter, which is signed "A Common Sense Engineer":

"It is possible, I hold, to transport freight and passengers from New York to San Francisco in ten hours, providing only capital enough be furnished to construct the road properly. With certain modifications the plan which I herewith submit to the public judgment could be made to work more easily and less expensively by aid of the power of Niagara Falls transmitted according to the well known scheme. If there were anything whatever in the Keely motor, that would be precisely the power I want. The plan proposed is as follows: A fair rate of speed for a railway train is forty miles an hour. The distance from New York to San Francisco is roughly three thousand miles. I would divide this distance into thirty parts, with stations at every 100 miles. First a track, not differing greatly from the ordinary rail-

road track, should be laid for a hundred miles, and it is only necessary to study rapid transit according to my plan over this section of the road to understand how the whole system would work. Over the first track of 100 miles, and running over cannon-balls upon that track is another, say 90 miles long, on which, in turn, is another, 80 miles long, and so on till on the whole system the freight and passenger train runs, it being of any desired and practicable length. Suppose it is required to go from A to B, a distance of 100 miles, the stable track over which all the others run is, of course, 100 miles long, and the first movable track upon it is 90 miles long. Let the first movable track be drawn by a stationary engine the 10 remaining 10 miles, whereby one of its extremities will reach B, and let us say that it takes fifteen minutes for it to move through the ten miles. In the mean time the track eighty miles long, which runs on the track ninety miles long, will have been advanced ten miles by the motion of the ninety-mile track, and will itself (either by means of a stationary engine or a locomotive) have advanced ten miles on its own hook, so that in all it will have gone twenty miles in the fifteen minutes, and its extremity will reach B at the same time that B is reached by the ninety-mile track. So with the seventy, the sixty, the fifty tracks, and up to the passenger and freight trains, which will reach B as soon as the ninety-mile track reaches B—that is to say, in fifteen minutes, at the end of which it will have traveled about 100 miles. Perhaps the following statement will make the matter clearer. Let us call the ninety-mile track A; the eighty-mile track B, and so on. A is drawn ten miles, carrying with it B for the same distance. But B has a motion of its own, and travels over ten miles on its own account. It has therefore gone 20 miles; C, with a ten-mile motion of its own over B, which draws it along, has gone 30 miles; D, 40; E, 50; F, 60; G, 70; H, 80; I, 90; J (which is the passenger and freight train), 100 miles, and all in fifteen minutes. The whole system of tracks need not be more than four or five feet in height. With sufficient power the scheme is practicable, and with motors at present at our command it would work for short distances."

A Large Turn-table.

Mr. C. A. Greenleaf, of Indianapolis, is putting in a large turn-table at Chicago for the Pittsburgh, Fort Wayne & Chicago road. It is intended for use by the heaviest class of consolidation freight engines, and is calculated to carry a load of two tons per lineal foot on the track. It is 59 feet long, weighs 44,000 lbs., and is a deck or covered pit table. The turn-table proper is almost entirely of wrought-iron and steel, and the floor is of Southern pine. It is a centre-bearing table, but will not tip; the locking attachment holds the table in line and surface, while a locomotive is passing on or off, and a series of rollers near the base of the pedestal holds the table level while being turned around.

American Passenger Cars for Spain.

We believe that no American rolling stock has ever been sent to Spain, the railroads of that country being equipped chiefly with English cars and engines, built on English plans. The Harlan & Hollingsworth Co., at Wilmington, Del., is now, however, building several passenger coaches for a Spanish railroad. The road is the "Ferro-Carril de Vals a Villa Nueva y Barcelona," and the cars are ordinary day coaches on the American plan. It is possible that this order may be the beginning of a larger trade.

Gunning.

A train on the Memphis & Charleston Railroad was stopped by a man who gave a danger signal with a flag. Then he took deliberate aim with a gun at the engineer and killed him. He subsequently explained that he was out hunting locomotives. He proved to be a lunatic.

Considerable amusement was occasioned on an incoming train this morning by a little incident that occurred. A vendor of vegetable ivory goods tackled a green-looking bridegroom, whose fair and blushing bride sat beside him. The greeny looked over all the fancy articles, and finally decided upon a rattle-box. The occupants of the car, who had been intently watching the couple, burst out into a simultaneous roar of laughter, and the rustic bridegroom could not imagine the cause of the merriment.—*Fl. Wayne (Ind.) Sentinel*.

The other day an express train on the Wabash, westward bound, was flagged when about four or five miles out from Toledo. The train stopped, and a little boy not much bigger than a hitching-post got on. Stepping up to the conductor, he said, in a loud, shrill voice: "You may make up yer mind to stop here every day, mister, for I'm a going to git on here reg'lar, after this."—*Toledo Blade*.

Railroad men tell the story of a clerical looking person who walked into the office of the Chicago & Alton road last week and asked the fare to Kansas City. He was told 50 cents, when he drew out his credentials and threw down a quarter for half fare.

Yesterday morning there were received at the depot one car of wheat, one car of beer and one car of potatoes. This may be the proper proportion, but the usual ratio is two cars of whiskey and three cars of beer to one car of potatoes. We want the outside world to understand that Arizona is becoming properly civilized.—*Tucson Star*.

One of the grandest pleasures of railroad traveling to lovers has been destroyed. Now, before a train enters a tunnel, a pirate goes through the cars and lights all the lamps.

The Boston *Advertiser* perpetrates the following paragraphs:

No railroad history is complete unless it is illustrated with numerous "cuts."

There is a vast amount of "truck and dicker" in railroad management. The "truck" is necessary, and the "dicker"—well, that seems to be necessary too.

When a business man fails he generally asks for an "extension." The railroads, however, are very apt to want an extension when they are doing the most profitable business.

There is a great difference between the rolling stock and the capital stock of a railroad. The former is kept on the move, but the latter always has to be held.

Railroad superintendents know that time "flies," but take little heed of the fact. They confine themselves to the "running time."

There is a great difference between freight and cargo. Almost anything will make freight, but it takes a locomotive to make a cargo.

The Pullman hotel cars are a great convenience to travelers. But still the roads generally rely upon the Westinghouse machinery to brake fast.

A conductor knows when he has gutter good place.

A Libel on Lake Captains.

A Buffalo lake captain, when interviewed regarding his experience of the great gale of two weeks ago, answered that he spent more than an hour in prayer. A Chicago captain said he was made to feel what an awful sinner he was. A Clevelander replied that he made a solemn vow to quit swearing in case he was saved. An interview was held with a Detroit captain yesterday to see how he felt. It started off as follows:

"You were in the great gale were you?"

"I was."

"As the gale increased the seas grew higher and your

foretopmast was broken off, did you realize what a miserable old sinner you was?"

"No, sir. My time was occupied in clearing away the wreck and thinking how the owners would blast my eyes."

"By and by, when the seas swept your decks and carried off your yawl at the davits, did you make any vows?"

"I did not. I told the mate that we'd got to square off and run before it, or we'd all be in — in less than twenty minutes."

"You meant Texas, did you not?"

"I did. I knew we were headed directly for Texas, with the seas piling right over us."

"Did your mate suggest holding a prayer meeting or singing any Gospel hymns?"

"Not by a gone sight! He suggested that we'd better be mighty lively about paying off or the infernal old tub would be at the bottom of Lake Michigan."

"When the awful voice of the gale roared in your ears, and the mountainous combers rushed down, as if to bury you from sight, did you have the least thought of making a vow to quit swearing if you were spared?"

"No, sir; on the contrary, I believe I swore faster than usual. I was in a hurry to get her around."

"As the wheel was put over and she fell into the trough of the sea for a moment, what were your solemn reflections?"

"Well, sir, I solemnly reflected that if the blasted old sticks ever wanted to play dirt on me then was the time to do it."

"When you got squared away before the wind, did you tell your crew that they ought to return thanks to Providence for having escaped certain destruction?"

"No, sir; I told 'em to ask the steward for about three fingers of good whisky apiece and then turn in all standing."

"Do you feel that you have any particular cause to be thankful?"

"I do. The elevator men in Buffalo didn't steal but 40 bushels of wheat out of this last trip, while on the other they took 91! I am very thankful for that 51 bushels, and shall strive to be a better man hereafter. Take sunthin', sir?"

Detroit Free Press.

Show Your Tickets.

There is a rule observed at the Michigan Central Depot, which, excellent as it is in itself, is regarded by the majority of travelers as a source of annoyance; that is, the locking of the gates leading to the cars, and the necessity all travelers are under of showing their tickets before passing the gates.

The other night a party of Detroit ladies and gentlemen went down to meet friends who were coming in on the 11:50 train, and for an hour or more they sat in the depot, passing the time in eating hot chestnuts and telling stories.

The man at the gate was unusually strict that night and could neither be coaxed nor bribed to admit any of the party to the inside, where the weary travelers would look for familiar faces. But hard-hearted as he seemed he is not altogether flint, as was proven later, when a poor, tottering, bowed old woman accosted him, asking in a tremulous voice if she might go through to meet her only son who was coming on that train.

"No; impossible. The rules could not be broken!"

The poor old woman coughed feebly and was turning away. Then she said, in a dreary voice:

"He is stone blind. If you see him groping about, will you kindly help him?"

"Oh, in that case, mother, I think I may suspend the rules — pass through," and the old woman thanked him and tottered feebly in.

A lot of travelers showed their tickets, and were told to move on. Then a lovely girl touched the gatekeeper's arm:

"My mother is coming on that train and is an invalid. Oh, sir, will you kindly allow me to meet her?"

"Passin'," said the man gruffly, "I suppose circumstances alter cases."

Presently a young man appeared, breathless with haste.

"Has the train arrived?" No! Well, that is good. I am not too late. Let me go through?"

"Ticket?"

"No, sir! My father's body is on the train. Oh, if you are a son—"

"Pass through."

In a few minutes another man appeared, and made as if about to go through the gate.

"Locked! oh yes, that's right; but I'm in a hurry—business there, you know. That's the train now—undertaker—"

he whispered in the official ear, and he too walked through the gate.

The gate-keeper was just beginning to wonder if any of the people he had permitted to pass were thieves and pick-pockets, when the crowd of travelers began to surge back again, and a fine-looking elderly lady and gentleman passed arm-in-arm.

"My blind son," murmured the lady mischievously.

And he could neither arrest nor hang her!

"My invalid mother," laughed the young lady, who followed close behind.

"My father's body," echoed the young man who escorted a hearty, white-haired traveler.

"And I'm the undertaker," said the last of the party, as he dodged a billet of wood, "I undertook this whole scheme. Rules are like pie crust, made to be broken sometimes. Good night."

But no one will ever get through those gates again without a ticket or a diploma from the railroad company.—*Detroit Post and Tribune.*

Too Good an Officer.

In a report on the civil service in New Zealand, just published, the following passage occurs:

"In Auckland we found that on Feb. 26, 1879, a Traffic Manager who had had great experience in the management of railways in India and Australia was appointed to take charge of the traffic on the Auckland line, with inducement held out to him of increased salary if he could reduce the working expenses of that line from its then rate of 94 per cent. of the gross earnings to anything under 70 per cent. While he continued in this position the expenses were reduced to 68 per cent., and that certainly without any friendly aid from his superior officer, the Auckland General Manager. The loud complaints which had previously been made by the Auckland public were silenced, and his conduct seems to have been satisfactory. In consequence of the language and actions of his unfriendly superior, this officer felt compelled to resign. His resignation was accepted, and, although the General Manager was censured for his action toward this subordinate officer, his services are retained, while the too successful Traffic Manager has been lost to the service, and the public complaints are again revived. So little encouragement does this service offer to meritorious or even successful officers, and so easy is it made to drive away any dangerous rival."

The New Zealand railroads are owned and worked by the government.

A Tough Story from England.

An extraordinary railway accident occurred a few weeks ago in England. A train leaves London by the Midland Railway every evening at half-past eight. The Scotch express follows at quarter-past nine, and passes the first at Leicester. As the express nears Leicester it is customary to

slacken the speed and watch for the signal that the first train has been switched upon a side track and that the line is clear.

On the night in question the engine-driver on the express train was compelled to bring the train to a stop, and wait a minute or two before the signal was displayed. In stopping the train the engine was reversed, but the engineer forgot, after stopping, to reverse it again. Accordingly, when the signal was displayed the train was started backward. It appears that neither the driver, the fireman, nor any other person on the train, with the exception of the rear guard, observed that the train was backing. It ran a full half mile in the wrong direction, and came in collision with the engine of a coal train, which was coming forward on the same track. Two or three of the cars were telescoped, and a number of people were injured. It seems almost incredible that an engineer should not notice from the motion that he was going backward, and almost as incredible that he should not have discovered it by looking forward upon the track.

Continuous Brakes in France.

A recent official report to the French Minister of Public Works on the best methods of preventing railroad accidents says that all French railroad companies are now experimenting with one or more forms of continuous brake. The Western Company has adopted the Westinghouse automatic, the Northern the Smith vacuum. The Paris, Lyons & Mediterranean is experimenting with both of these brakes. The Eastern is improving and applying the Achard electric brake, the Orleans is trying at once the Smith vacuum and the Heberlein (German) brake, and the Southern is beginning to try the Westinghouse brake on a large scale. The report says that the experiments made by the Western Company since April, 1878, with the Westinghouse brake "now seem decisive, and appear to leave no further doubt as to the practical advantages of this system." This company, at the close of last year, had this brake applied to 100 locomotives and 900 cars, and it has recently decided to apply it to 57 more engines and 500 cars, when it will be used on all its express trains.

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—Track is reported laid down the Rio Grande some 25 miles south of the late terminus at San Marcial, 125 miles south of Albuquerque, and 1,027 miles from Atchison. Work is progressing steadily toward the junction with the Southern Pacific.

Baltimore, Cincinnati & Western.—The Baltimore Gazette says of this projected line: "The road will be 571 miles in length, and the route selected is a practicable and beautiful one. From Baltimore to Elkridge, thence across the main stem of the Baltimore & Ohio Railroad and off into Montgomery County, crossing the Metropolitan Branch of the Baltimore & Ohio above Rockville and intersecting the Baltimore & Potomac road at Ball's Bluff. The eastern terminus will be at Curtis' Bay, on the Baltimore side, opposite to Canton, and on the southern boundary of the city. The western terminus will be Cincinnati. The following counties in the states through which the road passes, will be traversed: Maryland—Baltimore, Anne Arundel, Howard and Montgomery; Virginia— Loudoun, Clarke and Frederick; West Virginia—Hampshire, Hardy, Pendleton, Pocahontas, Randolph, Webster, Nicholas, Clay, Braxton, Kanawha, Putnam, Winfield, Macon and Cabell; Ohio—Lawrence, Greenup, Scioto, Adams, Brown, Clermont and Campbell. Leaving the Maryland line the road on its route first goes to Leesburg, Va., thence to Winchester, and down the valley to Moorefield, Hardy county, W. Va. This includes the Eastern Division, a distance from Baltimore of 90 miles. Branching westward the route lays through miles and miles of valuable iron and coal lands, the next principal stopping place being Charlestown. By careful estimates the company are assured that for 100 miles through which the new railroad passes in West Virginia on the route to Charlestown there are 6,400,000,000 tons of coal of the value of \$4,267,000,000, when all the other immense veins in the vicinity are considered. The Ohio River is crossed about Ironton, in the southeastern part of the state of Ohio, and the road there winds up along the river banks to Cincinnati."

Baltimore & Ohio.—The application of the Pullman Palace Car Company for an injunction to restrain this company from running sleeping cars, which, it is alleged, are infringements of the Pullman patents, came up before the United States Circuit Court in Baltimore, Nov. 4. Three days were occupied in the presentation of the affidavits and other testimony, and the exhibition of models of cars before the court. The defendant sought to establish that the Pullman Company had really no claim to priority of invention, its cars being merely imitations of older devices which anyone had a right to copy. Models were shown of cars used on the Cumberland Valley road in 1836, and on the Richmond, Fredericksburg & Potomac in 1838, and other early sleeping coaches were instances. Proof was brought to show that the Rock Island road had run its own sleepers since 1864 without interference.

Arguments were begun Nov. 8, and were expected to continue all the week. The case may be closed, but it is not at all probable that any decision will be given this week.

Bell's Gap.—Track is now laid on the extension of this road from Lloydsville, Pa., northwest to Coalport in Clearfield County, Pa., about 12 miles, making the road 20 miles long from its junction with the Pennsylvania Railroad at Bell's Mills. The extension passes over some valuable coal lands.

Brooklyn Elevated.—On application of the Attorney-General of New York, at the request of Richard G. Phelps, Receiver of this road, Alfred Wagstaff has been appointed co-Receiver by the New York Supreme Court. An application for authority to permit the Receivers to go on and complete the road is now pending.

Burlington, Cedar Rapids & Northern.—The extension of the Pacific Division is now completed to Clarion, the county-seat of Wright County, Ia., which is 55 miles northwest of the old terminus at Holland, and 103½ miles from the junction with the main line at Vinton. Trains will very soon run through to the new terminus.

Burlington & Missouri River in Nebraska.—The trains of the Eastern Division of the Republican Valley line now run to Chester, Neb., four miles east of the late terminus at Harbine, and 45 miles from Red Cloud. Work on the extension eastward is in progress.

Central and Union Pacific.—It is reported that representatives of these companies are now in session in New York to consider the question of a consolidation of the two companies. Nothing is definitely known about the matter, but the rumor is that additional stock will be issued to equalize values, the Union Pacific stockholders receiving a bonus of 15 or 20 per cent.

Chicago & Eastern Illinois.—The board of directors has voted to pay 4 per cent. interest on the income bonds

out of the earnings of the fiscal year ending Aug. 31 last. The payment will be made Dec. 1 at the Central Trust Company in New York and the Globe National Bank in Boston.

Chicago, Milwaukee & St. Paul.—Track on the Iowa & Dakota Division is reported laid for 20 miles west of the late terminus at Mitchell, Dak. There is some heavy grading to be done on this line, and it is thought hardly possible that the track can reach the Missouri this season.

The company has secured the right of way through the Indian reservation west of the Missouri, agreeing to pay \$110 per mile, and, in addition, a fixed price per acre for depot grounds.

Chicago & Northwestern.—Notice is given that the surviving trustee under the Beloit & Madison mortgage has chosen by lot 57 bonds to be redeemed for the sinking fund, the numbers drawn being 5, 7, 43, 46, 47, 57, 59, 71, 72, 77, 78, 87, 106, 164, 168, 169, 171, 174, 185, 189, 190, 191, 192, 193, 206, 209, 216, 219, 220, 221, 224, 231, 255, 271, 276, 278, 279, 281, 284, 289, 306, 307, 309, 310, 313, 326, 329, 333, 349, 350, 353, 358, 367, 371, 373, 386, and 387. These drawn bonds will be redeemed at 105 and accrued interest at the Chicago & Northwestern office in New York, Dec. 31, 1880, and interest on them will cease from that date.

The regular trains on the Toledo & Northwestern line this week began to run to Webster City, Ia., the crossing of the Illinois Central. This is 42 miles beyond the late terminus at Gifford and 82 miles from the main line at Tama.

The extension of the Menominee River line westward to the iron mines along the range has been completed from the old terminus at Quinnesec to Florence, a distance of 17 miles.

The Chicago & Tomah and the Milwaukee & Madison companies, both proprietary lines of this company, have voted to consolidate the two organizations. The consolidated corporation will be known as the Milwaukee & Madison Company.

Chicago & Western Indiana.—A dispatch from Chicago, Nov. 10, says: "The State Supreme Court to-day made public a decision refusing a *supersedeas* in the case of the Lake Shore & Michigan Southern against the Western Indiana Railroad. This is a case involving the condemnation of certain land, necessary to secure entrance into the city, of the Western Indiana Railroad. It is a substantial victory of the latter road over the Lake Shore."

Connotton Northern.—Track is now laid on this extension of the Connotton Valley road from Canton, O., north to Hartsville, 12 miles, and this section is now being ballasted. Further progress is delayed for a time by a bad swamp at Hartsville, in which it has been found necessary to drive piles as a foundation for the track. From Hartsville to Kent, about 12 miles, the grading is all done.

Dallas & Wichita.—Track is now laid to Hickory Creek, Tex., five miles westward from the late terminus at Lewisville, and 27 miles from Dallas. Grading is nearly done to Denton, nine miles further.

Denver & Rio Grande.—This company is now pushing work on no less than six branches or extensions at once. The San Juan line is now nearly completed to the Chama Summit, 50 miles west of Animas, Col., and will soon be in the San Juan Valley, where work can be pushed toward Durango and Silverton.

The New Mexico line is expected to be running in December to Santa Cruz, 22 miles from Santa Fe, which is to be the terminus, and 28 miles beyond Caliente.

The Silver Cliff line is nearly all graded from Canon City to Silver Cliff, and the prospects is that tracklaying will be finished this year.

On the Eagle River line from Malta through Tennessee Pass to Eagle River, track is laid from Malta west 12 miles and Red Cliff is to be reached in two months or so. From Red Cliff to Eagle River will be built next year.

The Leadville, Ten Mile & Breckenridge line is to have its terminus at Frisco, instead of Breckenridge, as at first intended. This line is to be done this year from Leadville north to Kokomo.

On the Gunnison line the bridge over the Arkansas at Salida is done, and track laid three miles from the main line at Salida. This line will cross the Marshall Pass with grades of 211 feet to the mile, and run down Marshall and Tumichi creeks to Gunnison. The whole line, with a branch from Poncha to Maysville, is under contract to be finished by June next.

Denver, South Park & Pacific.—It is reported that negotiations have been in progress for the consolidation of this company with the Denver & Rio Grande. It is said that a substantial agreement as to terms has been reached, but that the matter is in suspense at present, because counsel have given an opinion that authority must be obtained from the Colorado Legislature before the consolidation can be completed.

Des Moines & Minneapolis.—Suits have been begun by this company against certain stockholders to recover the value of stock held by them, or compel them to surrender the stock. It is alleged that the defendants were incorporators of the company, or nearly all of them; that they elected themselves officers and directors of the company in January, 1874, and July 14, 1874, issued to themselves certificates of stock, to the amount named above, to represent shares, each share to be \$100; that for this stock they have not paid one dollar, that the issue of such certificates of stock was in violation of the charter of the company, which says all shares of stock must be paid for before they are issued. The road is now controlled by the Chicago & Northwestern.

East Tennessee, Virginia & Georgia.—From Nov. 1 last, local passenger rates on this road are reduced to following figures:

Straight tickets, 4 cents per mile.
Round trip tickets, 30 days' limit, 3½ cents per mile, each way.

Unlimited thousand-mile tickets to families or firms, separately, not to both combined, 3 cents per mile.
Thousand-mile tickets, good only for one person, and limited to one year, 2½ cents per mile.

Passengers who do not purchase tickets will be charged 5 cents per mile.

Genesee Valley.—At a meeting of the Commissioners of the Land Office in Albany, N. Y., Nov. 5, it was resolved to sell to the Genesee Valley Railroad Company all the interest of the state in the banks and prisms of the Genesee Valley Canal lying between the Erie Canal, in the city of Rochester, and the village of Mill Grove, in Cattaraugus County for \$11,500, being at the rate of \$100 per mile. The state reserves certain rights over such feeders and reservoirs as may be determined by the State Engineer. It is a further condition of the sale that the purchasers shall build a railroad along the whole length of the canal within a reasonable time.

Grand Southern.—The work on the various bridges needed for this road is being prepared and the bridge builders are getting ready to erect them. The bridges are to be erected at the following points: Lancaster, Musquash, Le-

preaux River, Magagundavic, Big New River, Little New River, Popologan, Little Lepreaux, Lepreaux and Digdiguash.

Greenville, Columbus & Birmingham.—This company has contracted with the Indianapolis Rolling Mill for iron rails for 10 miles of road.

Hannibal & St. Joseph.—Notice is hereby given that 25 land grant bonds were, on Nov. 6, drawn for redemption under the terms of the mortgage, and will be redeemed by the Farmers' Loan and Trust Company in New York. The numbers drawn were 16, 46, 53, 185, 195, 209, 311, 374, 470, 488, 541, 556, 579, 588, 636, 638, 665, 703, 708, 724, 728, 780, 834, 840 and 845. Interest will cease 60 days from date of drawing.

Illinois Central.—This company reports earnings of its lines in October as follows:

	1880.	1879.	Increase.	P. c.
In Illinois.....	\$675,091.00	\$625,948.94	\$49,142.06	7.9
In Iowa (leased lines).....	185,033.00	181,910.21	3,122.79	1.7

Total.....\$860,124.00 \$807,859.15 \$52,264.85 6.5
During October, 1880, the land sales were 2,141.08 acres for \$13,196.92, and the cash collected on land contracts was 13,516.63.

Indianapolis, Delphi & Chicago.—Work is progressing from both ends of the extension of this road from Rensselaer, Ind., north by west to Dyer, on the Joliet Cut-off of the Michigan Central. Track is laid from Dyer south eight miles, and from Rensselaer north also eight miles, and the gap of 24 miles is all graded. For convenience in using the equipment now on the road the track from Rensselaer north is laid temporarily of 3 ft. gauge, but will be changed as soon as arrangements can be completed for changing the 88½ miles of the old road between Rensselaer and Delphi to standard gauge.

International & Great Northern.—The grading of the extension from Austin, Tex., to San Antonio is nearly finished, and the workmen are being transferred to the line beyond San Antonio, where ground has already been broken. It is reported that two lines are to be built, one running directly to the Rio Grande, near Eagle Pass, and thence down the river, while the other will leave the first line at a point not yet determined and run to Ft. Clark and thence up the Rio Grande towards El Paso.

Knoxville & Ohio.—It is stated that negotiations are in progress for the extension of this road to the Kentucky state line, to meet there the extension of the Louisville & Nashville's Knoxville Branch. If the result is favorable, it is understood that the agreement and a plan for the extension will be submitted to the Knoxville & Ohio stockholders at their annual meeting in a few days. The cost of the extension is estimated at over \$760,000.

Louisville & Nashville.—This company intends to make extensive improvements in Nashville, Tenn. A new depot will be built to serve for all the lines entering Nashville; also a building for general offices and extensive new shops. The shops will include a freight repair shop 200 ft. diameter; a car-erecting shop 80 by 200 ft.; paint shop, 80 by 200 ft.; foundry, 70 by 200 ft.; smith shop, 70 by 200 ft.; locomotive-erecting shop and machine shop, each 80 by 200 ft. There will also be a wheel foundry and several other buildings, a round-house for locomotives, a storehouse and office building.

Macon & Brunswick.—In his recent message to the Legislature the Governor of Georgia, after rehearsing the history of the attempted sale on Nov. 6, 1879, and its actual sale on Jan. 13 last, says: "On Feb. 28, 1880, the lease and sale were concluded, and the road transferred to James M. Couper, George H. Hazlehurst, A. J. Lane and W. M. Johnston, as lessees first, and afterward as purchasers. All of the provisions of the law were complied with. The sum of \$250,000 in 4 per cent. bonds of the state of Georgia was paid by the purchasers, and the title transferred. The purchasers have already begun to survey a route for the extension of the road from Macon to Atlanta, as required by the act, in twelve months after the execution of the lease."

"The act has been fully executed, the sale of this valuable property having been effected to a strong company, financially responsible, and in every way legally bound to carry out to the letter the law of the purchase, and I have every reason to believe they will comply with their obligations."

"The directors of the Macon & Brunswick Railroad make their final report of their management of the road from Sept. 30, 1878, the date of their last report, to Feb. 29, 1880, when they turned over the road to the lessees and purchasers. The earnings during this period were \$638,731.36, and the expenses \$496,246.35, leaving balance of \$142,484.91. The road has paid into the treasury during these 17 months \$164,608.12, which includes some of the earnings previous to October, 1878. Considerable addition was made to the equipment of the road, including engines, cars and rails. The directors refer to the reduction of the net income received by the state from the road by several large amounts paid since the road was seized by the state in 1873, including \$97,796 of fare bills of the old company, \$11,585.06 of old mortgage bonds, and \$14,041.60 of freight balances lost, due by the Atlantic & Gulf Railroad of freight balances."

"The directors have been engaged, under executive directions, since the sale of the road, in winding up the unsettled business, a portion of which still needs some attention, but is in process of settlement."

Missouri, Kansas & Texas.—The St. Louis Globe-Democrat reports that orders have been given to send a large portion of the Kansas Pacific business over this road from Junction City, Kan., and also to take freight from the Atchison, Topeka & Santa Fe at Emporia on the same line, the object being to send business from both roads around by the Missouri, Kansas & Texas, so as to avoid Kansas City and escape the division required by the existing pool at that place.

Nashua & Lowell.—At the meeting held Nov. 10, the stockholders voted by a large majority to ratify the agreement for the lease of the road to the Boston & Lowell Company at a fixed rental of \$60,000 a year. The Boston & Lowell stockholders also met on the same day and voted to ratify the lease.

Nashville, Chattanooga & St. Louis.—A new building, three stories high and handsomely finished, is to be erected for the general offices of this company in Nashville.

New Orleans Pacific.—Work is now in progress on the grading for 55 miles out of Shreveport, La., and but 20 miles more are to be let before reaching the grade already finished. The American Railway Improvement Company has agreed to have the road in running order to Lecomte, 145 miles from Shreveport, by Aug. 1, next. By that time it is expected that the extension of Morgan's Louisiana & Texas road will be finished to Lecomte, and a connection can be made for New Orleans at once. The company, however, will not rely on the Morgan road, but will go on with its own line to New Orleans.

New York Central & Hudson River.—This company's official statement of gross earnings for October is as follows:

	1880.	1879.
Passengers.....	\$741,739.07	\$640,783.77
Freight.....	2,001,509.89	1,974,113.10
Miscellaneous.....	351,889.39	277,089.32

Total.....\$3,095,138.35 \$2,898,586.19
The increase was \$196,612.16, or per cent. The gain was in passengers and miscellaneous, freight showing a very small increase. October is the first month of the new fiscal year.

North Atlantic City.—This company has filed articles of incorporation in New Jersey, to build a railroad three miles long from the inlet at Atlantic City northward to Brigantine Beach, lately renamed North Atlantic City.

Ogden & Idaho.—A dispatch from Portland, Oregon, says: "Colonel J. Richardson, one of the leading spirits of the Utah & Northern Railroad, was in this city this week, and he brings information which may be relied upon as authentic, that Jay Gould and his associates of the Union Pacific Railroad have raised all the necessary funds and completed all the arrangements for building a standard-gauge railroad from Ogden to Boise City, Idaho Territory, a distance of 250 miles. The narrow-gauge road from Ogden, already built, will be utilized, from Ogden 40 miles north, by laying a third rail. The railroad will be completed within eight months. The Grand Ronde Branch of the Oregon Railway & Navigation lines to Baker City, Oregon, will be completed about the same time, and there will then remain only 100 miles to complete another trans-continental railway."

Ohio & Mississippi.—Receiver King reports to the Court for September as follows:

Balance, Sept. 1, 1880.....	\$301,351
Receipts for the month.....	578,898
Total.....	\$880,249
Disbursements.....	606,544

Balance, Oct. 1.....\$273,705
Disbursements include \$863 for vouchers prior to Nov. 18, 1876, and \$214,482 for the July coupons on first-mortgage bonds.

The Receiver issues the following notice: "By direction of the Circuit Court of the United States for the District of Indiana, I will, on Nov. 1, 1880, pay, on presentation at the First National Bank of Springfield, Ill., the interest coupons of the mortgage bonds of the Ohio & Mississippi Railway Company, Springfield Division, which fall due on that date, and on the same day will pay on presentation at the office of the company, 52 William street, in the city of New York, the interest coupons of the Ohio & Mississippi Railway Company which fell due Oct. 1, 1880. On Nov. 5, 1880, I will pay on presentation at the First National Bank of Springfield, Ill., the interest coupons of the mortgage bonds of the Ohio & Mississippi Railway Company, Springfield Division, which fell due Nov. 1, 1877."

"And on Nov. 12, 1880, I will pay on presentation at the office of the company, 52 William street, in the city of New York, the interest coupons of the second mortgage bonds of the Ohio & Mississippi Railway Company, which fell due April 1, 1877."

"The said several overdue coupons will be paid at their face value on the surrender thereof, without prejudice to the right of any party receiving such payment to demand hereafter that interest be paid on all such overdue coupons from the time of maturity until payment, the question of the right of any party to interest upon such overdue coupons being reserved by the court for future determination. A record will be kept of the names of parties surrendering such coupons for the purpose of such future payment of interest, in case it shall be determined that the parties are entitled thereto."

Ohio & West Virginia.—On the branch or extension from Gallipolis, O., northeast up the bank of the Ohio River to Pomeroy, track is now laid to Middleport, 17 miles from Gallipolis, leaving about five miles to reach Pomeroy. It is expected that trains will run through this month. This extension will make the road 87 miles long from Logan to Pomeroy, the distances by rail from Columbus being 115 miles to Gallipolis and 137 to Pomeroy. The road is controlled by the Columbus & Hocking Valley Company.

Oregon Railway & Navigation.—This company makes the following statement for the month of October:

	Gross earn.	Net earn.
River Division.....	\$254,500	\$129,500
Ocean Division.....	77,000	34,000
Railroad Division.....	51,400	38,400

Total.....\$382,900 \$201,900
Total net, October, 1879.....244,337

Decrease (17.4 per cent.).....\$42,437

The company informs us that Vice-President T. F. Oakes reported, under date of Oct. 30, that on the Columbia River line, from the Dalles to Wallula, 67 miles of track were laid, leaving 46 miles to be laid out of the total length of 113 miles.

Pennsylvania.—The following is a statement of all the dividends declared by this company since its organization in 1855:

	Per cent.
1856—May, 4 per cent.; Nov., 4 per cent.....	8
1857—May, 4 per cent.; Nov., passed.....	4
1858—May, 3 per cent.; Nov., 3 per cent.....	6
1859—May, 3 per cent.; Nov., 3 per cent.....	6
1860—May, 3 per cent.; Nov., 3 per cent.....	6
1861—May, 3 per cent.; Nov., 3 per cent.....	6
1862—May, 4 per cent.; Nov., 4 per cent.....	8
1863—May, 4 per cent.; Nov., 5 per cent.....	9
1864—Feb., 30 per cent. in stock; May, 5 per cent. in cash; Nov., 5 per cent. in cash, 10 p. r cent. stock subscription privilege a par, making total pure dividend of.....	40
1865—May, 5 per cent.; Nov., 5 per cent.....	10
1866—May, 5 per cent.; Nov., 4 per cent.....	9
1867—May, 5 per cent. in stock and 3 per cent. in cash; Nov., 3 per cent. in cash.....	11
1868—May, 5 per cent. in stock and 3 per cent. in cash; Nov., 5 per cent. in cash.....	13
1869—May, 5 per cent.; Nov., 5 per cent.....	10
1870—May, 5 per cent.; Nov., 5 per cent.....	10
1871—May, 5 per cent.; Nov., 5 per cent.....	10
1872—May, 5 per cent.; Nov., 5 per cent.....	10
1873—May, 5 per cent. in cash; Nov., 5 per cent. in script.....	10
1874—May, 5 per cent.; Nov., 5 per cent.....	10
1875—May, 4 per cent.; Aug., 2 per cent.; Nov., 2 per cent.....	8
1876—Feb., 2 per cent.; May, 2 per cent.; Aug., 2 per cent.; Nov., 2 per cent.....	8
1877—Feb., 2 per cent.; May, 1½ per cent.....	3½
1878—Nov., 2 per cent.....	2
1879—May, 2 per cent.; Nov., 2½ per cent.....	4½
1880—May, 3 per cent.; Nov., 3 per cent. in cash, 1 per cent. in scrip.....	7

Making a total of.....229

Of this 183 per cent., or an average of 7.32 per cent. yearly, has been paid in cash. The scrip dividend of November, 1873, was not worth par when it was issued, but

all, or nearly all, the stock dividends have been at a premium when issued. It is said that these premiums and those on the stock privileges have been worth 32½ per cent. of the face of the stock, making the total return of the stock in 25 years 281½ per cent., or at the average rate of 10.46 per cent. yearly. The moderate dividend this month, in the face of net earnings large enough apparently for one twice as large, indicates a disposition on the part of this company to take a conservative course and strengthen itself in time of prosperity for the days when it will not be so easy to make a good dividend, of which it has recently had a serious experience.

In answer to complaints from Philadelphia merchants to the effect that the company was exercising discrimination against that city by the issue of limited tickets which did not allow the holder to stop over there, this company has made an arrangement by which an extension of time is allowed on limited tickets from southern and southeastern points. A stop-over of three days at Philadelphia will also be allowed on New York limited tickets, provided a continuous journey is made to Philadelphia.

Philadelphia & Reading.—The Philadelphia Ledger, which is popularly regarded in Philadelphia as a semi-official organ of the Reading management, says:

"We have obtained from the officers of the Reading Railroad an abstract of the present financial condition of the company. Irrespective of interest on the floating debt, the total cash fixed charges of the Railroad Company and the Coal & Iron Company together for interest are as follows:

	1880.	1881.	1882.	1883.
Total fixed charges.....	\$4,018,789	\$4,037,713	\$5,493,867	\$5,850,023
Add interest on floating debt.....	800,000	800,000	800,000	800,000

Total.....\$5,718,789 \$5,737,713 \$6,293,867 \$6,650,023

"The difference in the fixed charges for the several years named is due to the fact that coupons have been cut off and funded upon the junior obligations, and that it is not until July, 1882, that the full interest has to be paid, after which the fixed charges for subsequent years are exactly the same as those for 1883."

The actual earnings of both companies applicable to this interest up to Sept. 30, 1880, were.....\$4,084,824
Estimate for October.....850,000
Estimate for November.....800,000

Total.....\$5,734,824

"Or enough to meet all interest obligations upon all classes of obligations which must be paid in cash."

The total floating debt of both companies is at present \$10,127,490
Add for receivers' obligations outstanding.....2,493,102
Add for risks on contracts and bills receivable.....500,000
Add for all default in interest, less the half coupon on the general mortgage to be paid Nov. 9.....520,000

Total.....\$13,552,593

"In order to provide for the floating debt of the companies we are informed that the reported 'deferred bond' plan is about to be adopted, and that the English projectors had deposited \$2,040,000 caution money as a forfeit, with a banking house in New York to bind the contract. This plan involves the issue of \$34,200,000 of deferred income bonds, entitled to a dividend up to 6 per cent. out of the profits of the company only after the common shares have had 6 per cent. When each class has had 6 per cent. each is to be entitled equally to half of the surplus, the remaining half of the surplus to go into a reserve fund to provide for interest generally in case of deficiency in bad years. The shareholder will be entitled to subscribe at 30 per cent. for \$50 of the deferred income bonds for each share held by him, \$3 to be paid on subscribing, \$4 in 30 days after the allotment, and the remaining \$8 in two equal payments at intervals of 60 days. The London syndicate, acting through a London banking house, probably Morton, Rose & Co., agreed to deposit with an American bank, to be named by the company, the sum of \$2,040,000, as a forfeit to the company in case they fail to comply with an obligation to take at the issue price all of the deferred income bonds not taken by the shareholders, and have further agreed that out of the deposit money the company may retain up to \$1,000,000 whatever is necessary to make up the second instalment of \$4 on such amount as may not be taken by the shareholders. It is stated that a form for the guaranty contract will reach this country in about 10 days; that all the Reading Receivers and the board of managers have approved the conditions above mentioned, and that the prospectus is likely to be issued within two weeks, or as soon as the contracts can be signed, the preliminary negotiations having thus far been conducted by cable. This issue, if consummated, will produce \$10,200,000. It is then proposed to sell the \$5,000,000 of unused general mortgage bonds of the company, which, after the success of deferred income bonds, it is assumed, will sell for par, making \$5,000,000 or a total of \$15,200,000, which, after payment of the commission for guaranty, will leave the company more than \$1,000,000 over and above its cash requirements. Out of the large amount of collateral returned to the company by the payment of the floating debt, it is proposed by sales to raise enough money within the next two years to meet the deferred coupon scrip which matures in 1882. In reference to the proposed issue of deferred income bonds, the suggestion is made by some of the parties interested that after the payment of the floating debt the remaining fixed charges will amount to about \$6,000,000 annually, and 6 per cent. on the stock will be about \$2,000,000 more, so that the deferred bonds would come in for whatever surplus might be left after this absorption of \$8,000,000 of the net earnings."

On Nov. 5, the announcement was made in Philadelphia of the probable adoption of this deferred income bond plan. On the same day it was also stated that the Board of Managers and the representative of the English Committee had agreed upon a reorganization committee to act in this country.

The names of the gentlemen composing the committee were announced as follows: J. B. Lippincott, of the firm of J. B. Lippincott & Co., publishers, and one of the managers of the company; I. V. Williamson, retired merchant, and one of the managers; Eckley B. Cox, of Cox Bros., coal operators in Drifton, Luzerne County, Pa., and one of the managers; H. Pratt McKean, retired merchant, and one of the managers; Moses Taylor, of New York, or a representative to be named by him (the Receivers were appointed on Mr. Taylor's application); Charles H. Rogers, President of the Tradesmen's National Bank; Isaac Hinckley, President of the Philadelphia, Wilmington & Baltimore Railroad Company; Frederick Fraley, President of the Schuylkill Navigation Company and Secretary of the Centennial Board of Finance; Daniel R. Bennett, President of the Little Schuylkill Railroad Company; Thos. Cochran, President of the Guarantee Trust and Safe Deposit Company.

Mr. John C. Bullitt, Counsel of the Fidelity Trust Company, trustee of the consolidated mortgage, on Nov. 5 notified the Receivers that all objection to the payment of half the coupon of the consolidated mortgage, as announced by the Receivers for Nov. 9, was withdrawn, and the payment was therefore made as advertised.

Pittsburgh, Cincinnati & St. Louis.—Sealed propo-

sals will be received at the office of Chief Engineer M. J. Becker, in Columbus, O., until Nov. 20, for the excavation of a tunnel 3,300 feet long, and the partial timbering of the same, and the excavation of the approaches, near Gould's station, seven miles west of Steubenville, O. Plans, specifications, etc., can be had on application at the office.

Pittsburgh & James River Valley.—The project for a connection between Pittsburgh and Richmond by way of West Virginia and the James River Valley is being industriously worked up. An excursion was started over the route last week, the parties joining it being chiefly Pittsburgh iron men and officers of the new Richmond & Allegheny road, which is to be part of the proposed line.

Plymouth, Kankakee & Pacific.—The Kankakee (Ill.) Gazette reports that persons have been buying up the bonds of this defunct company, and that the purchasers have expressed their intention of securing control of all the claims against the property. It is believed that they mean to complete the road, which was partly graded seven or eight years ago.

Rio Grande & El Paso.—This company has filed articles of incorporation in Texas to build a railroad from the New Mexico line southward to El Paso. The incorporators are all connected with the Atchison, Topeka & Santa Fe, and the company is to build the short section of that road which will be in Texas.

Rutland.—The Boston Advertiser says: "The Rutland Railroad Company defaulted on Nov. 1 for the fourth time on their first mortgage \$8. There are about \$240,000 of these bonds outstanding. Several suits were brought a year since against the company in the United States Courts to enforce payments on coupons due May 1, 1879, the first on which default occurred. These suits were recently terminated by the company's payment of the coupons upon which suit was brought, with 6 per cent. interest from their due date, in accordance with the decision in the Cheever & Hart case. Suits were brought a month ago on coupons outstanding, and it is understood new suits will be brought on each successive default."

St. Louis, Iron Mountain & Southern.—A dispatch from St. Louis says that the provisional injunction heretofore granted by the United States Circuit Court against this company at suit of the Southern Express Company was, on Nov. 6, modified by Judge Treat, so that no accessory charges shall be exacted; that no discrimination as to return of empty legs or packages shall be made, or as to compensation for freight between the rates required of the plaintiff and other express companies, or of the defendant; defendant shall not prevent or refuse the transportation of express matter offered by the plaintiff for a reasonable compensation, the same not to be more than present rates, nor exact the contents of packages as a prerequisite to said transportation. It also provides that the plaintiff's messengers shall, on payment of the passenger fare, have the same accommodations for the care and custody of shipments as are accorded to the messengers of other express companies, including those of the defendant.

St. Louis & San Francisco.—The Arkansas Division is now open for travel to Seligman, Mo., 30 miles south from the junction with the main line at Plymouth. This is five miles more than was heretofore reported.

St. Paul & Duluth.—The Taylor's Falls & Lake Superior Branch is now completed to Taylor's Falls, Minn., 10 miles northwest from the late terminus at Centre City and 21 miles from the main line at Wyoming, which is 30 miles north of St. Paul.

Securities on the New York Stock Exchange.—The following securities have been placed on the lists at the New York Stock Exchange:

Atchison, Topeka & Santa Fe, stock, \$25,000,000.
Chicago, Milwaukee & St. Paul, Hastings & Dakota Division, \$25,000 bonds, numbered 3,086 to 3,610, inclusive.

International & Great Northern, first mortgage bonds, \$400,000.

Shenandoah Valley.—This company has decided to establish its repair shops at Luray, Page County, Va., provided the county will pay at once its subscription of \$200,000 in county bonds.

The company has engaged an engineer to make a reconnaissance of the country from the Chesapeake & Ohio at Waynesboro to Bristol and thence down to Chattanooga. He is to report not only on the practicability of the route, but also on the mineral resources of the country.

Sonora Railroad.—A correspondent of the Chicago Tribune, in a long letter dated at Guaymas, Mexico, Oct. 10, says:

"Now as to the Sonora Railway Company (limited): What has it done and is it doing?"

"This company, composed chiefly of Boston capitalists, organized under the laws of the state of Massachusetts, for the purpose of doing business in Mexico, is working under what is called the 'Blair Concession,' an authority which it is claimed is still in force. Pending final action by the Mexican Congress, this company was allowed to begin work last spring, bonds to the amount of \$50,000 being deposited with the Mexican government. I have the whole history of this project from its inception in 1860, under the auspices of Gov. Pesquiera, of Sonora, the Hon. Alexander Willard, American Consul at Guaymas, and others, but it is not necessary to give details here."

"In April last, W. R. Morley, Esq., Chief Engineer, formerly a leading engineer of the Atchison, Topeka & Santa Fe Railroad, arrived in Guaymas with a corps of assistants, and at once began work. A schooner-load of material just arrived from San Francisco furnished tools and powder, and natives of the country, Mexicans and Taquis, were at once employed. More engineers and skilled labor soon arrived and vast amounts of material were received during the summer, so that the heavy work around Guaymas was completed in good season, and the work beyond that put under contract. After extraordinary labor and great tact and skill in dealing with intricate questions, Mr. Morley can now congratulate himself on the success of his efforts. The difficulties of such an enterprise as beginning to build a railroad at a distant point from other roads, in a country like Mexico, are incredible. A strange country and foreign language; infrequent communication with the East and with San Francisco, mails being irregular and no telegraph line; a people who did not half believe in the good faith of the enterprise, and who yet united with cheerful unanimity in getting the highest possible prices for their labor and what they had to sell; labor inconstant and careless; these and a thousand other impediments have been overcome by Mr. Morley's ability and energy, ably assisted, however, by Mr. W. W. Symon, an Englishman, but a resident of Mexico for some seventeen years."

"About a mile and a half east of the city of Guaymas is a half rocky, half sandy peninsula of considerable extent, called Punta Arena, or, in English, Sandy Point. This peninsula divides the outer harbor from the inner one, and it was here that the railroad company commenced operations, clearing and leveling the ground for depot grounds, yards,

LOCOMOTIVE RETURNS, JULY, 1880.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Number of locomotives in service.	Number of miles operated.	MILEAGE.		MILES RUN TO TON OF COAL.			Plant of oil.	Average No. of loaded freight cars hauled.	COST PER MILE IN CENTS FOR						AVERAGE COST OF	
			Total.	Average per engine.	Coal.	Card of wood.	Repairs.			Fuel.	Stokers.	Miscellaneous.	Engines, if men and wages.	Coal, per ton.	Wood, per cord.		
Allegheny Valley, River Division*.	139	34	70,240	2,331	41.85	23.41	21.50	0.865	6.92	2.92	0.45	6.26	15.75				
Low Grade Div.*.	120	19	26,770	1,941	32.30	19.60	22.90	0.863	4.57	3.23	0.64	6.33	14.77				
Central Pacific, Western Div.*.	300	20	76,002	2,533	42.13	19.24	17.71	0.40	3.96	1.71	0.40	7.5	30.05				
Northern & San Pablo Div.*.	104	28	27,557	2,126	39.43	20.18	18.04	0.45	3.37	1.31	0.37	7.50	4.50				
Visalia Div.*.	177	9	24,544	2,277	39.91	20.28	18.74	0.42	4.70	1.84	0.08	6.65	30.9				
Tulare Div.*.	170	11	30,239	2,749	33.93	14.68	22.04	0.61	9.13	2.04	0.16	8.77	40.71				
Los Angeles, San Diego, Yuma & Wilmington Div.*.	769	51	160,911	3,318	46.56	17.20	15.97	0.51	1.88	1.97	0.51	6.82	25.47	7.50	4.50		
California Pacific Div.*.	170	10	31,777	3,174	49.06	20.44	15.19	0.36	1.53	1.19	0.36	6.43	24.31	7.50	4.50		
Stockton & Copperopolis*.	49	4	7,134	1,784	50.23	21.17	13.21	0.41	8.43	1.21	0.41	5.60	28.20	7.50	4.50		
Sacramento Div.*.	119	4	101,044	2,526	40.22	21.18	15.94	0.42	4.47	1.94	0.42	4.40	30.11				
Oregon Div.*.	205	25	6,002	2,744	34.50	15.07	18.33	0.36	1.69	1.51	0.36	7.2	17.67				
Truckee Div.*.	300	20	54,109	2,705	43.00	15.83	16.82	0.40	10.46	16.82	0.40	3.36	37.53	7.0	4.50		
Humboldt Div.*.	219	28	81,300	2,977	33.74	16.91	22.18	0.52	3.12	22.18	0.52	7.19	33.94	7.50	4.50		
Salt Lake Div.*.	153	26	74,975	2,873	49.16	21.45	11.88	0.34	2.53	3.18	0.34	5.17	11.13				
Terre Haute Div.*.	12	10	38,790	3,232	34.00	22.00	32.00	0.30	4.15	3.75	0.30	4.76	19.90				
Chn. Lafayette & Chicago*.	75	10	34,581	3,458	40.49	14.62	14.62	0.29	2.70	4.94	0.29	5.67	13.77				
Cleve., Col. Cn. & Ind.*.	472	12	167,165	3,553	35.91	17.89	16.03	0.53	2.11	6.03	0.53	6.49	15.16				
Cleveland & Pittsburgh*.	225	41	167,270	3,924	52.00	16.51	16.70	0.821	2.67	2.83	0.36	6.51	17.4	1.40	2.80		
Cleveland, Tus. Valley & Wheeling*.	150	16	55,162	3,448	31.74	14.34	1.77	0.54	4.30	1.77	0.54	5.05	12.35	0.68	2.40		
Dela., Lacka. & Western, Bloomsburg Div.*.	80	24	68,716	2,635	40.12	25.12	4.45	0.53	3.45	1.77	0.53	4.45	8.23				
Erie & Pittsburgh*.	98	10	40,037	2,502	34.57	39.48	20.70	0.39	2.88	6.01	0.39	4.28	13.62				
Grand Rapids & Indiana*.	210	16	179,255	3,190	44.00	16.88	20.28	0.32	2.78	6.84	0.32	5.07	22.40	3.75	2.80		
Green Bay & Minnesota*.	564	58	301,535	2,693	41.72	16.88	20.28	0.32	2.78	6.84	0.32	5.07	22.40	3.05	2.42		
Houston & Texas Central*.	383	97	108,822	2,813	40.12	16.88	20.28	0.32	2.78	6.84	0.32	5.07	22.40	1.40	3.75		
Illinois Central, Chicago Div.*.	103	11	16,822	1,530	40.49	16.35	13.21	0.39	3.94	4.16	0.39	4.64	13.92				
Middle Div.*.	345	52	120,185	2,194	38.54	15.66	14.35	0.39	3.94	4.16	0.39	4.64	13.92				
North Div.*.	113	16	35,671	2,474	37.44	15.66	14.35	0.39	1.40	3.51	0.29	4.67	9.9	1.25	0.90		
Springfield Div.*.	401	47	110,671	2,553	35.91	18.45	12.43	0.39	3.19	5.85	0.27	5.1	13.13	2.60	5.25		
Iowa Div.*.	220	41	166,385	3,920	40.19	14.90	24.30	0.680	2.63	5.10	0.34	1.98	6.05	16.16	2.25	2.0	
Jeffersonville, Madison & Ind*.	347	38	117,481	3,820	63.30	23.60	16.56	0.39	3.70	4.60	0.39	6.04	13.3	2.70	3.75		
Kan. City, St. Jo. & Council Bluffs*.	84	24	36,004	2,459	37.70	64.20	24.24	0.39	3.82	7.10	0.39	6.04	17.29	2.60	5.60		
Buffalo Div.*.	117	17	2,573	2,441	35.43	20.00	6.64	0.27	3.89	6.64	0.27	5.70	16.6				
Erie Div.*.	384	30	438,927	3,119	42.86	22.55	3.80	0.39	3.80	7.39	0.39	5.70	17.41	3.07	4.38		
Toledo Div.*.	207	10	12,381	1,238	35.43	20.00	11.0	0.39	3.82	7.10	0.39	6.04	17.29	3.10	4.65		
Mich. Southern Div.*.	207	10	12,381	1,238	35.43	20.00	11.0	0.39	3.82	7.10	0.39	6.04	17.29				
Little Rock, Miss. River & Texas*.	470	65	128,262	2,138	39.67	12.66	16.58	1.00	4.0	0.99	0.33	1.28	6.86	1.96	2.15		
Louisville & Nashville, First Div.*.	320	32	78,733	2,461	33.06	2.49	14.11	1.130	6.32	5.38	0.22	1.60	6.7	1.96	1.88		
Second Div.*.	131	18	36,354	2,020	51.35	15.73	11.68	1.43	5.16	5.16	1.43	1.8	11.12				
Memphis Div.*.	122	19	51,644	2,718	34.94	16.00	16.73	1.10	7.9	6.11	0.24	1.73	6.26	21.60	7.77		
Nash. & Decatur Div.*.	189	30	10,816	3,585	39.91	19.51	14.1	1.120	3.41	4.95	0.28	6.81	15.8	1.75	2.01		
South & North Alabama*.	135	24	70,711	2,928	38.08	19.31	13.58	1.231	7.1	3.59	0.2	1.53	6.8	18.41	1.21		
Evansville, Hen. & Nash. Div.*.	180	19	45,602	2,558	42.77	17.52	12.49	1.240	2.91	4.74	0.32	6.81	16.14	2.25	1.90		
Mobile & Montgomery*.	207	21	62,804	2,731	50.11	18.66	12.8	1.070	2.79	3.14	0.21	1.0	5.21	15.8	1.50		
New Orleans Div.*.	141	23	53,849	2,341	43.43	25.98	12.12	1.040	3.0	4.47	0.40	2.12	17.32				
Marquette, Houghton & Ontonagon*.	80	30	35,460	1,755	41.80	20.47	14.11	1.130	1.57	1.13	0.41	6.51	18.46	4.50			
Missouri, Kansas & Texas*.	705	98	23,653	3,454	42.24	16.83	17.19	1.091	4.1	4.43	0.43	6.11	13.54				
N. Y. Penn. & Ohio, 1st and 2d Divs.*.	228	91	283,346	2,724	37.48	15.21	21.10	0.34	3.14	5.78	0.50	6.46	15.83				
Third and Fourth Divs.*.	197	61	162,434	2,663	40.66	16.12	13.80	0.39	4.48	5.13	0.39	6.14	6.24	2.20	2.67		
Hannibal Div.*.	98	49	148,391	3,089	44.73	20.82	30.50	0.39	3.68	4.82	0.39	5.87	14.1	1.84	2.67		
Northern Central, Elmira & Can. Div.*.	147	40	138,573	2,824	29.90	17.28	3.13	0.15	3.13	6.15	0.43	6.25	15.96	1.80	2.56		
Pennsylvania, New York Div.*.	124	109	780,496	3,311	36.38	19.00	9.9	0.80	7.90	9.9	0.80	18.60	3.60	3.9			
Amboy Div.*.	304	46	14,906	2,257	50.13	15.10	5.59	0.72	5.59	7.2	0.72	13.23	3.61	3.63			
Baltimore Div.*.	110	38	63,893	2,182	21.30	14.0	9.2	0.90	4.90	9.2	0.90	13.90	3.60	3.3			
Philadelphia Div.*.	206	148	431,846	2,918	27.70	13.48	9.26	0.46	9.26	4.6	0.46	14.70	1.20	2.80			
Middle Div.*.	132	103	314,083	3,055	27.90	12.12	14.30	4.55	0.60	4.55	0.60	19.30	1.20	2.80			
Pittsburgh Div.*.	226	163	495,444	2,590	39.11	12.19	9.59	4.71	9.59	4.71	0.60	14.81	1.30	2.80			
Toldeo, Pa. & Warsaw*.	10	34	19,508	1,950	39.10	13.40	6.29	0.70	6.29	7.0	0.70	11.50	1.20	2.81			
West Penn. Div.*.	104	20	45,828	2,241	40.83	42.37	7.2	3.11	7.2	3.11	0.20	15.70	1.20	2.81			
Lewistown Div.*.	63	9	17,149	1,905	34.42	19.53	9.0	0.49	11.7	9.0	0.49	15.70	1.20	2.80			
Bedford Div.*.	57	4	11,016	2,754	31.53	20.94	9.0	0.30	9.0	3.00	0.30	13.20	1.2				
Frederick Div.*.	19	10	12,505	1,257	1.53	19.61	2.57	1.53	1.1	5.10	0.50	6.7	2.56	3.84			
Pittsburgh, Va. & Charleston Div.*.	39	13	19,7	1,515	44.59	19.38	2.20	0.20	2.20	2.0	0.50	5.40	1.20	2.83			
Pitts., Ft. Wayne & Chi., East Div.*.	971	108	389,977	3,065	43.90	22.2	25.7	0.799	4.58	3.13	0.32	1.51	6.22	16.82	1.38	1.58	
Western Div.*.	280	108	389,977	3,065	43.90	22.2	25.7	0.799	4.58	3.13	0.32	1.51	6.22	16.82	1.38	1.58	
Pitts., Cin. & St. Louis, Little Miami Div.*.	107	38	104,444	2,749	50.60	13.15	15.83	0.946	6.7	4.30	0.89	2.22	5.96	18.94	2.11	1.56	
P. C. & St. L. Div.*.	942	103	394,555	2,859	31.80	19.68	21.05	0.660	4.09	2.88	0.31	1.91	7.49	0.86	2.23		
St. Louis & San Francisco*.	592	104	14,548	1,454	38.20	10.10	3.11	4.97	3.11	4.97	0.41	5.95	14.44	1.9	1.50		
Savannah, Florida & Western*.	350	108	19,771	1,977	31.9	13.25	16.40	0.40	13.25	16.40	0.40	6.34	13.54				
Toledo, Peoria & Warsaw*.	237	46	29,652	2,671	31.9	13.4	16.40	0.40	13.4	16.40	0.40	6.34	13.54	1.30	2.50		
West Jersey*.	103	31	29,652	2,692	41.13	13.25	16.40	0.40	13.25	16.40	0.40	6.34	13.54	1.30	2.50		

* Five empty cars rated as three loaded ones.
+ Switching engines allowed 6 miles per hour; helping engines, actual distance run.
+ Switching engines allowed 6 miles per hour.
+ Fuel